ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF

THE ILLINOIS STATE MEDICAL SOCIETY

VOL. LIX | OAK PARK, ILL., MAY, 1931 | No. 5

ILLINOIS MEDICAL JOURNAL

Published monthly by the Illinois State Medical Society under the direction of the Publication Committee of the Council.

GENERAL OFFICERS, 1930-1931

PRESIDENT.....WM. D. CHAPMAN, Silvis
PRESIDENT-ELECT.....R. R. FERGUSON, Chicago
FIRST VICE-PRESIDENT.....B. G. WILCOX, Joliet
SECOND VICE-PRESIDENT.....OTTO HUBER, Chicago
TREASURER.....A. J. MARKLEY, Belvidere
SECRETARY.....HAROLD M. CAMP, Monmouth

THE COUNCIL

E. H. Weld,	1st District, Rockford	1932
E. E. Perisho,	2nd District, Streator	1932
F. R. Morton,	3rd District, Chicago	1932
J. S. Nagel,	3rd District, Chicago	1931
Thomas P. Foley,	3rd District, Chicago	1933
E. P. Coleman,	4th District, Canton	1931
S. E. Munson,	5th District, Springfield	1931
Chas. D. Center,	6th District, Quincy	1933
I. H. Neece,	7th District, Decatur	1931
Cleaves Bennett,	8th District, Champaign	1932
J. W. Hamilton,	9th District, Mt. Vernon	1933
J. S. Templeton,	10th District, Pinckneyville	1933

EDITOR
CHARLES J. WHALEN.....25 E. Washington St., Chicago

GENERAL COUNSEL
FRANCIS X. BUSCH.....231 S. La Salle St., Chicago

PERMANENT HISTORIAN
IRVING S. CUTTER.....801 East Chicago Ave., Chicago

MEDICO-LEGAL COMMITTEE
J. R. BALLINGER, *Chairman*.....2724 W. North Ave., Chicago
GEORGE H. WEBER, *Secretary*.....Peoria

EDUCATION COMMITTEE
MISS JEAN MCARTHUR, *Secretary*..185 N. Wabash Ave., Chicago

SCIENTIFIC SERVICE COMMITTEE
JAMES H. HUTTON, *Chairman*..6056 Cottage Grove Ave., Chicago
HAROLD M. CAMP, *Secretary*.....Monmouth

PUBLICATION COMMITTEE
J. W. VAN DERSLICE, *Secretary*.155 N. Ridgeland Ave., Oak Park

Outside of editorial or allied views or statements that are the authoritative actions of the Illinois State Medical Society, the organization denies responsibility for opinions and statements published in the ILLINOIS MEDICAL JOURNAL. Views expressed by the various authors and views set forth in various departments in the JOURNAL represent the views of the writers.

State Society will pay no bills for legal services except those contracted by the Committee. Notify the Chairman at once. Do not employ attorneys.

Send original articles, advertising copy, cuts and all communications relating to advertising to Dr. Charles J. Whalen, c/o ILLINOIS MEDICAL JOURNAL, 185 N. Wabash Ave., Chicago.

Membership correspondence to Dr. Harold M. Camp, Monmouth, Ill.

Society proceedings and news items and changes in the mailing list to Dr. Henry G. Ohls, Managing Editor, 1618 Juneway Terrace, Chicago.

Contributors will submit all copy for publication typewritten on standard size paper and double spaced. Copy not complying with this rule will be returned, if convenient.

Subscription price of this JOURNAL to persons not members of the Illinois State Medical Society is $3.00 per year, in advance, postage prepaid, for the United States, Cuba, Porto Rico, Philippine Islands, Hawaiian Islands and Mexico. $3.50 per year for all foreign countries included in the postal union. Canada, $3.25. Single current copies, 50 cents.

Editorials

A NEW BLIGHT IS AFFECTING EDUCATION AND INDUSTRIES—ITS NAME IS STANDARDIZATION

Five or six years ago that learned man and great humanitarian, President Eliot of Harvard University said aptly: "A New Blight Is Affecting Education and Industries in the United States. Its name is Standardization. It is obvious that standardization has become a dangerous adversary of progress in both education and industry. . . . Fix standards in labor, in study in modes of family life, or of community life are down right enemies of progress for the body, mind and soul of man."

The trend of the times makes economic factor in medical practice the destructive element in scientific progress and the inevitable force that will so aid in the encroachment of paternalism upon democracy's rights that the day when medicine is practiced no longer by physicians but is controlled and managed and politically managed by the laity will be the day when the doom of individual rights and community independence is sounded by the installation of the worst bureaucracy the world has ever known and under whose advanced guards the law ridden United States is already knuckling. Standardization the handmaid of bureaucracy has United States by the throat. Truly it has been said that "America is forced by law to do, and prohibited by law from doing more things than had been prohibited or required in autocratic Europe before the war. New and interfering laws multiply in the United States as rapidly as the staggering tax levies that are required to pay for the administration of meddling statutes that nobody wants and that nobody needs except members of the bureaucracy rapidly destroying personal freedom and making the United States the worst of autocracies with the situation paralleling pre-revolution France.

Over-centralization of power at Washington

with its usurping of state rights, community rights, individual rights, affects the medical profession most seriously at those loop holes discovered where the profession comes in contact with the world at large in joint administration with laymen; in legislation; and in economic life of the individual doctor and contact with the public.

ORGANIZED MEDICINE IN ILLINOIS HAS GIVEN A WONDERFUL SERVICE

1. It is conceded by many medical men throughout the country who occupy high official positions, that Illinois is at least five years in the lead in medical alertness and accomplishment in safeguarding the vital interests of the profession.

2. The medical profession in Illinois has almost one hundred per cent. single standard for entrance in the practice of medicine.

3. Illinois is one of the few states where the physicians are not humiliated by having to sit on licensing board with non-medical men.

4. During a period of twenty-five years not one piece of legislation inimical to the profession, has been enacted in Illinois, in spite of the fact that at each session of the legislature, from one hundred to one hundred and fifty bills affecting the status of the profession have been introduced.

5. The educational committee work of the Illinois State Medical Society is commended by everyone in official medical practice over the United States as far ahead of that of any other medical society in accuracy, alertness and efficiency.

6. Illinois is one of the three states in the union that never had a co-operative Sheppard-Towner law.

7. Due in a large measure to the alertness of the medical profession in Illinois we have no compulsory health insurance in this country.

8. Parent-Teachers associations in this state have been induced to have pre-school examinations done at the physician's office rather than at clinics.

These accomplishments, with many others, have been brought about by the untiring efforts of men you have elected to office in the past.

MATERNITY BILL TO BE OFFERED AT THE NEXT CONGRESS

Senator Jones Says Plan Approved in Conference Will Be Passed Early in Session

According to the *United States Daily,* March 21, 1931, we quote:

The Jones maternity bill to provide for Federal aid in the dissemination of information and service in the promotion of health and welfare of mothers and infants, which failed of enactment in the closing hours of the last Congress, will be reintroduced immediately after the reconvening of the next Congress, and its early passage is anticipated, Senator Jones (Rep.), of Washington, stated orally March 20.

The bill was passed by the Senate during the last session, sent to the House and amended there, and a compromise agreement reached in conference. The compromise agreement was before the Senate at adjournment.

NO CHANGE PLANNED

The bill will be introduced, Senator Jones said, in the same form as accepted in conference, in order to expedite its passage.

As passed by the Senate the scope of the measure was confined exclusively to welfare work in maternity. The House broadened its scope, however, to include Federal aid in general rural health work. This amendment was accepted by the Senate conferees during the last session, and Senator Jones expressed the belief that it would meet with little opposition from the Senate as a whole.

FUNDS AUTHORIZED

The bill would authorize the appropriation of $1,000,000 annually to be distributed among the various States proportionally for health work, such funds to be matched by equal amounts of State funds.

It is designed to continue the work begun under the Sheppard-Towner Act, which by statutory limitation expired in 1929.

Senator Jones predicted early action on the bill in the next session, pointing out that in a long session it is recognized as useless to filibuster. There will, of course, be "a lot of talk" against it, he said, but little opposition is anticipated when a vote is reached.

APOLOGIES TO DR. OLIN WEST

In the article in the April JOURNAL on "The Job of Editing a Medical Journal," pages 285-291, occurred a classical example of the mischance which dogs the editor in spite of utmost care. In this article, the last paragraph beginning on page 290 and extending to the top of page 291, appeared to be part of the editor's article, followed by a very brief discussion by Dr. Olin West.

This paragraph was really part of Dr. West's discussion and is reproduced as follows:

I recently heard of an incident in which a physician had written what was, in his opinion, a very splendid scientific paper, and sent it to the editor of a certain journal. The editor sent it back with a letter saying that while it contained some very excellent material, it was much too long, much too involved, and would not be read in its present form, and asked the writer to cut it down. He received in answer an insulting letter to the effect that the writer knew what he wanted to say and how to say it. Of course, he did not get very far with that. The editor told him, however, that he was going to take the liberty of having the paper revised and would then submit it to him. He turned it over to a manuscript editor who reduced it by about half and it was then returned to the physician without any comment or any marks of identification. A telegram came back saying that this was the best paper on the subject the gentleman had ever read, adding, "You can throw mine in the waste basket." It was his own paper, properly edited, with some of his idiosyncrasies eliminated. The paper was published in its revised form and created a good deal of favorable comment.

THE ATTEMPTED SOCIALIZATION OF THE PRACTICE OF OBSTETRICS. THE CHILD HAS BECOME THE BEST GRAFT.

The *Woman Patriot,* under date of January 15, 1931, in an article, "Enemies of Children and Freedom," gives some valuable data on the attempted communistic grant of power over American homes and children. We quote:

"*The Child Has Become the Best Graft.*" It is the children of America (up to 18 years) that both the revolutionary communist and the job-hunting social worker desire to nationalize, standardize and control, through one central Department or Bureau of the Federal Government.

"*The Children's Bureau* of our Labor Department, every one of whose drives for more power has been personally led by the communist, Mrs. Florence Kelley (nee Wischnewstzky), has sought over American mothers, babies and youth, exactly the same powers, up to exactly the same age, as assumed by the Soviet Government in Russia, and as demanded by the Workers Communist Party of America. (See *Daily Worker,* Communist, Dec. 5, 1924; *Workers Monthly,* Communist, January, 1925; and *Congressional Record,* July 8, 1926, for detailed documentary proof.)

"Therefore, both because it demands and constantly works for an arbitrary, despotic, communistic "full grant of power" over American homes and children, notwithstanding repeated decisions of the Supreme Court that neither the Federal Government nor any States government has power to "standardize children," and also *because it serves no useful or legitimate purpose whatever, the Children's Bureau should be abolished.*

"*All legitimate* facts and statistics which the Federal Government may or should gather and publish regarding the education, enumeration, births, deaths, diseases, health and labor of children, are better and more completely gathered and published by the Federal Bureau of Education, the Federal Division of Vital Statistics in the Census Bureau, the United States Public Health Service, and the Federal Bureau of Labor Statistics.

"*Four Federal Bureaus* investigating and reporting all legitimate facts and statistics regarding American children are enough! There is no need of a special *Fifth* Federal Bureau, claiming and attempting to usurp, 'the entire field of child welfare and child care' as the Federal 'Children's Bureau' does.

"When the *real mothers* of this country learn the whole truth about this *business* organized by Feminists and Socialists to substitute politicians for physicians in the 'care of maternity and infancy,' they will arise in their might and sweep the country clean of *political* accoucheurs, and insist, with Dr. Charles E. Humiston of Chicago, Ill., that 'the best is none too good' for American mothers and babies, and refuse to

tolerate longer the attempted *socialization* of the *practice of obstetrics* in a country where even the nationalization of railroads, coal mines and waterpower is not dared by the same political leaders who tamely submit, against their own better judgment, to Federal bills and proposed Constitutional amendments to place the lives and health, labor and education of all mothers, children and youth under control of one radical lay bureaucrat at Washington, who is neither doctor, lawyer, mother nor nurse!

ROLL OF HONOR

Senators who kept the faith and voted against the Jones Bill, January 10, 1931:

Republicans in Roman; Democrats in Italic; Farmer-Labor in Small Caps.*

Senator Hiram Bingham of Connecticut.
Senator William E. Borah of Idaho.
Senator *Edwin S. Brossard* of Louisiana.
Senator Frederick H. Hillett of Massachusetts.
Senator *Carter Glass* of Virginia.
Senator *William H. King* of Utah.
Senator Jesse H. Metcalf of Rhode Island.
Senator George H. Moses of New Hampshire.
Senator HENDRIK SHIPSTEAD of Minnesota.*
Senator Daniel F. Steck of Iowa.

PAIRED AGAINST JONES BILL

Senator *Harry B. Hawes* of Missouri.
Senator Lawrence C. Phipps of Colorado.
Senator *Claude A. Swanson* of Virginia.
Senator David A. Reed of Pennsylvania.
Senator *Millard E. Tydings* of Maryland.
Senator *David I. Walsh* of Massachusetts.

"Senator Reed Smoot of Utah, who was absent and without a pair on the day the final vote was taken, declared afterwards: "If I had been present, I would have voted against it." Senator Smoot had also voted before against it.

"All the above Senators equally "kept the faith." But particular attention is due Senator Shipstead of Minnesota, who, in 1927 voted *for* the extension and repeal in the belief *'that the agreement was made in good faith and will be kept.'* Senator Shipstead believes that a gentleman's agreement, particularly when made part of statute, should be kept—and keep it himself whether or not others in the agreement repudiate and evade it."

ALUMNI MEETING

The Alumni of the College of Medicine of the University of Illinois, formerly the Chicago College of Physician and Surgeons, will hold their annual luncheon at the Broadview Hotel, East St. Louis, Ill., at 12:15 noon, May 6, 1931, at the time of the meeting of the Illinois State Medical Society. Covers, one dollar. The local committee chairman is Dr. H. M. Voris, Collinsville and Pennsylvania Avenue, East St. Louis, Ill.

Further information can be obtained by addressing Dr. Edward Louis Heintz, Secretary of the University Hospital, N. W. corner Ogden Avenue, Congress and Lincoln Streets, Chicago, Illinois.

POST-GRADUATE COURSE IN NOSE AND THROAT SURGERY

The Post-Graduate Course of Ear, Nose and Throat Surgery at the University of Bordeaux, France, will commence July 27, 1931.

The course is given in the English language. The class is limited to twelve physicians and is offered by Prof. George Portmann.

For information apply to Dr. Leon Felderman, 413 Mitten Building, Philadelphia, Penna.

FACTORS WHICH HAVE BROUGHT ABOUT A FEELING OF UNREST IN THE MEDICAL PROFESSION

(a) Lessening of morbidity due to hygienic education and practice.

(b) Diminution of disease due to specific treatments for its specific manifestations.

(c) The increasing knowledge of specifics for standardized diseases has brought into play a vast possibility for self medication that the public has availed itself of with much avidity.

(d) Overcrowding of medical profession with its consequent debauching through economic pressure of the poorly qualified or ethically equipped membership.

(e) State pre-emption of professional privilege and other economic factors affecting necessary revenue.

(f) Increasing disposition to paternalism:

1. Federal interference.
2. State interference.
3. County or township interference.
4. Municipal interference.

(g) Increasing tendency to bureaucracy:
1. Installation of Portfolio of Medical Supervision.
2. Standardization of profession.
3. Destruction of individualism.

(h) Over-specialization of profession:
1. Increased cost of medical service.
2. Abolition of "family doctor."

(i) Centralization of political headquarters of medical control:
1. Washington, D. C.
2. Various state capitals.
3. County seats, etc.

(j) Medical legislation fiat in practice of medicine:
1. Harrison law.
2. Volstead act.
3. Smith-Towner bill.
4. Sheppard maternity bill.
5. Venereal disease control legislation.

(k) Unqualified admissions to license to practice:
1. Christian Science.
2. Chiropractics, Osteopaths, etc.
3. Over-trained nurses.

Witness desire of some cults, the Red Cross and other lay organizations to take over so-called "minor surgery," recommended by red-tape business organizations.

(l) Attempted financial segregation:
1. Tendency of moneyed foundations to despotism in professional mandates.
2. Tendency to make use of free clinics and sociological measures as a playground for wealthy faddists at expense of poor and diseased citizenry.

(I) False premonitions as to self preservation, *i. e.*, primitive desire to get without giving —"something for nothing."

Demanding adjustment are relations of ethical medicine with hospitals, dispensaries, universities practicing medicine, corporations practicing medicine, pay and part pay clinics, medical charities, endowed foundations, social service organizations, ill-advised but well meaning philanthropists, and other entities of unscientific, falsely premised effort, of which some exhibit tendencies to dominate situations vitally affecting the medical profession and bearing with menace upon the public health and upon civilization itself.

DR. FRANK BILLINGS IS RIGHT IN HIS PARTIAL DIAGNOSIS OF WHAT IS WRONG WITH MODERN MEDICAL PRACTICE WHEN HE DECRIES THE PROFESSIONAL TENDENCY TOWARDS MECHANISTICS

"I am sorry," so Dr. Billings[1] expressed himself candidly "that modern medicine has forgotten how to examine patients physically. This is a mechanistic age. Talk about the cost of medical care. If every man who comes in contact with patients and (I mean every practitioner) was resourceful, qualified, industrious and painstaking, he would make a diagnosis with the things that heaven has given him, without any instrumental aid beyond the simple things that every man can control, in 85 per cent. of all the cases."

This poignant comment from Dr. Billings rings as loudly now in the ears of thinking physicians as it did to those who heard him speak at the 1930 A. M. A. past-Presidents' dinner on the topic "What has most influenced my life."

Dr. Billings phrases in a nutshell whole pages of argument. We have all of us become more or less button-pushers. We have become more dependent upon machines than upon men. In some avenues of life this dependency possibly works no harm. In others, especially the intimate professions such as medicine, the danger is incalculable.

This angle of life with modern improvements is receiving great consideration everywhere from eminent thinkers, especially from medical servants.

Machinery and equipment can never replace mentality, science and skill. Individual skill, individual knowledge and individual judgment in individual cases are beyond the capacity and the jurisdiction of the most perfect machine invented. Yet standardization and standardized

1. From talks at Past Presidents' Dinner given by the Michigan State Medical Society, to Officers, Trustees and Delegates of the American Medical Association, Detroit. June 23, 1930.

mass production is becoming so powerful a fetish with the American people as to extend a malign influence into those regions and areas of the mental, moral and physical world where standardization is a useless tool. Nowhere is this more evident than in medical practice. Routine employment of mechanical therapy is even more dangerous than hap-hazard guess work. For frequently this reliance upon mechanical devices and routine stultifies both innate powers of discernment and decision. *Mechanics should supplement, not supplant individual ability.*

Diagnosis first. Then if necessary confirm the resultant decision by mechanistics. Auscultation and percussion should not be displaced by chest x-rays. Medical practice is an art and an individual science, first last and always. Reliance on mechanical appliances if persisted in too strongly will cause to atrophy both training and endowment of scientific skill. Personal accomplishment must be maintained. *What man wants to substitute mechanical locomotion for the use of his own feet?*

In this machine age not only mechanical appliances but transference of labor tend to promote the mechanization of medical practice. It has come about that the younger generation finds detail, decision, and actual performance altogether to irksome and tedious. That part of actual work, of responsibility and necessary tedium that cannot devolve upon a labor-saving machine, the average young practitioner is very willing, aye even eager, to pass over into the realm of "the specialist." For the dignity of personal performance is a land of the lost Atalantis in this very involved age of machinery so oiled and arranged that if the "laborer is worthy of his hire" he has already decided that he is too worthwhile to tire.

Where among younger men do you find a man who is "specializing in surgery" willing to quote that great and famous forbear in this art who said of himself, "I am a physician who practices surgery?" As to the tendency to be over dependent upon the specialist, let attention turn again to Dr. Billings,[2] who on another occasion said with truthful emphasis:

"The value of the application of group practice is limited. I believe that this is true. Ostensibly the group is formed for the avowed purpose of providing all patients with an accurate diagnosis and efficient treatment. This is made possible through the services of clinical and laboratory specialists and available equipment to obtain a precise knowledge of the physical and functional condition of the patient and to afford efficient general and special treatment, including hospital care, if that is deemed necessary. First, let us inquire how many patients of an average community require the application of these precise methods of diagnosis to arrive at a true understanding of the real condition, and how many of these patients require hospital care. Based on long experience in consultation and in general hospital and private practice, it is my opinion that a correct anatomic and functional diagnosis can be made in from 80 to 85 per cent. of all the patients of an average community by a qualified, industrious, painstaking general practitioner by the sole application of the trained mind, the special sense, the hands and an always available simple laboratory equipment. Likewise, approximately 80 per cent. of the patients will receive efficient management and treatment as ambulatory or house patients. Of course, it is advantageous that every hospital, with the possible exception of some very small or special institutions, should have the necessary laboratories, equipment and trained technicians to make these precise examinations and to afford adequate treatment of the few patients who really require their use.

"The truth is, the splendid knowledge which modern medicine has made available in the diagnosis and treatment of disease is misapplied frequently, with unfortunate derogatory effect on the public and the tendency to demoralize some members of the medical profession. This method of practice and the false impression gained by the public through private and public group medical and surgical service with the usually attendant high cost, are tantamount to commercialism. The public is slowly but surely becoming aware of these conditions in medical practice. Evidence of this point of view of the public is expressed by lay people in cities and in the country. Frequently the best families of the city inquire whom they may secure as a family physician. In this connection we must remember that the splendid character and accomplishments of the United States government are due in no small measure to the character-forming factor, the family home. The modern tendency in the cities, especially among the foreign-born population, is to seek tenement habitation, which tends to minimize the value of family life and to disregard the responsibilities of citizenship. This tends to engender the worst forms of socialism, and disregard of individual and community responsibility in the observance of the laws of sanitation, and also to promote disease and poverty. The future safety, prosperity and health of the people and the

2. Nu Sigma Nu Bulletin, April, 1929: Presidential address "Significant Landmarks in the Practice of Medicine of Fifty Years." Delivered at the twenty-fourth convention of Nu Sigma Nu, December, 1928.

maintenance of all the benefits which this republic affords demand the preservation of the character-forming family home.

"As a factor in this necessary principle of community welfare, the family physician and his domiciliary visits are essential. It is recognized that the general practitioner, both in the city and in the country, lacks sufficient hospital facilities in the care of his patients. This lack is evident in some of the rural districts of practically all the states of the Union. Some feasible constructive program should be adopted which will afford justice to the taxpayers and to the members of the medical profession, and which will provide better hospital and diagnostic facilities where they are needed. We must, however, keep in mind the fact that a majority of patients do not require the application of unusual and refined methods of diagnosis and also that a majority do not require hospital care."

What applied to the old time family physician must apply to the new. There was nothing mechanistic about the old time general practitioner unless it was his emergency ability to make a kitchen table and a jig-saw do the work of the modern costly and efficient equipment. Every day was an emergency in the days of the old time practitioner. In those days they were MEN of medicine rather than medicine's "man." Scientific minds rather than machines of science took the patient in hand and kept him a good citizen.

As an adjunct to personal performance in medical science the perfected mechanical apparatus now available for the medical profession is as necessary as the addition of motor bus and airplane to the railroad and steamship of the transportation world. But no machine ever invented can make up to a man for the transportation possibilities of shank's mare. And, figuratively speaking, it is this loss, insidiously stealing in upon the younger generation in bulk and the older generation in some specific instances against which the protest rises.

Dr. Billings is right. It is natural for man to choose the easier way. The average man is a creature as full of indolence as of original sin and his basic tendency is to get along easefully as he may. Since this natural desire for ease is the foundation stone of civilization and of progress the lapse is excusable—but only when it tends to improve and not to retard community well being. Accessorily speaking, mechanics in medicine are to be approved; elementally, no.

MEDICINE HAS ALWAYS BEEN A LAP AHEAD IN COMMUNITY SERVICE

What Seems New to Big Business Has Long Been An Oftold Tale to Medical Men

"Hygiea's" comment pertinent for dissemination to laity of well-known economic facts

Medicine has always been so far ahead of business in point of generosity in civic welfare and personal and professional charity at its own expense, that nothing big business can do in the way of philanthropy evokes from medicine much more than a grunt.

Of course, to big business in the main, profit-sharing or cost-cutting is the rarest of novelties. Medicine as a science and as a community unit is perfectly willing that big business shall enjoy to the fullest this new toy and new avenue for the dissemination of energy, authority and cash.

Medicine may be pardoned, however, for realizing that where civic welfare is concerned it is ahead of big business by several laps. Medicine is more than justified in emitting a large and competent roar when big business, actuated by the best of motives but a big off balance by the usual zest of the game with its new toy, attempts to trot out a few more toys at the expense of medicine. An inherency of ethical scientific medicine is that it is "more blessed to give than to receive." You can't "teach an old dog new tricks." Medicine knows all the tricks of charity at its own expense, and is in a position to teach rather than to learn from big business in this regard.

Under the caption "Current Trends in Medical Practice," the May, 1931, issue of "Hygeia" prints a neat compilation of facts about medical economics that it will be most educational to have both big business and general public digest at leisure.

That "Hygeia" is to be congratulated upon the publication of this article may be realized from the following excerpts:

CURRENT TRENDS IN MEDICAL PRACTICE

"Within the last fifty years scientific medicine has made greater advances than in the fifty centuries previously. It has freed mankind from the fear of disease. It has advanced the expectation of life at birth from 33 years, a rate still prevailing among savages, to 55 years for civilized man. For most of the infectious diseases it provides specific methods of prevention and cure. To persons who formerly would

have died inevitably in a short time from diabetes it offers insulin; to those who would have died promptly from pernicious anemia it offers liver extracts; to the sufferer from the incurable Addison's disease, it provides a new extract from the cortex of the adrenal gland. Even those with the mysterious invasion of the brain by new growths and tumors can take advantage of the marvels of modern surgery. New studies have been made on the care of the mentally defective. What other profession can produce so enviable a record!

"It is not surprising that an enlightened public, aware of these facts, should demand of the medical profession some scheme of organization to provide in increasing measure the best type of medical service for all the people at a price that they can afford to pay. The public has seen motor cars reduced in price to meet the purse of almost any one capable of making a living without reducing profits to manufacturers. The vastly developed mail order houses and chain stores, through group buying and selling, have been able to lower the prices of various commodities. Hence it is argued that similar organization in the field of medicine will enable the physician to lower the prices of medical services greatly and thus to bring them within the reach of any worker.

"For centuries tradition in medicine has demanded that the physician give freely of his services to those unable to pay. For centuries physicians have rendered such services and have depended on their incomes from those able to pay to give them a reasonable return on their investment. Few of the public realize the extent of that investment. The modern physician has put in at least two years in a university, four years in a medical school, a year or two years as an intern in a hospital and perhaps a year or two as an assistant before he begins to earn a living. His education has cost him approximately $1,200 a year and does not take into account the money that he might have earned in some other occupation, the interest on the investment, and the equipment of his office when beginning practice. It is safe to say that there is an outlay of from $12,000 to $20,000 before the physician begins to earn. If this sum were invested for him at 20 years of age he might be financially independent at the age of 50—but how few physicians really are! The investigations indicate an average annual income for doctors of from $3,000 to $4,000. It is impossible to separate economics from the problem of medical care.

"Hospital development has been one of the most remarkable phenomena of the current century. In order to conserve the efforts of physicians and to distribute them more widely and in order to apply to patients all the advances of modern medicine, hospitals have increased steadily. In 1909 there were 4,359 reasonably good hospitals in this country. In 1930 there were 6,719, an increase of 54 per cent. In the same time the bed capacity rose from 421,065 to 955,860, an increase of 127 per cent. At least two-thirds of all physicians licensed to practice in the United States now have connection with these institutions. Of these 98,491 physicians who do much of their work in the hospitals, about 45,000 are specialists. So greatly has diet come to be significant in the care of the sick that the number of dietitians has increased enormously. It may be estimated that the number of people caring for the sick today includes not only the 150,000 physicians but also some 1,850,000 others, such as pharmacists, nurses, technicians, orderlies, dietitians, cooks, maids and ambulance drivers.

"The great expansion in the nature of medical practice has made it seem possible to many social workers and philanthropists that still greater organization would do much to lower the price of medical care. They urge, indeed, that the doctors be still further specialized, sitting all day in one spot, the hospital, wherein the patients pass in a steady stream before them much as the Ford chassis receives the tender ministrations of the nut and axle specialists in Mr. Ford's mammoth manufactory.

"Unfortunately doctors have been inclined to leave the direction of medical institutions too greatly to lay control. The business directors argue that the public gives the doctor a hospital as a place in which to work and that it is none of his business how the place is run and who provides the finances. Nothing could be more fallacious. The doctors make the hospital. Without them it is merely four walls and a lot of medical apparatus. Its merits cannot surpass their merits. The medical staff is the hospital. Who picks a hospital because it has a fine operating room rather than a competent surgeon?

"Practically every plan yet developed for changing the nature of medical practice involves standardization of doctors and standardization of patients. The success of the practitioner in the past has depended on the ability of the individual physician to realize the needs of the individual patient and to satisfy them.

"Dr. Williard C. Rappleye, dean of Columbia University College of Physicians and Surgeons in New York, expressed the opinion of every great leader in medicine today when he said: 'Any plan, whether developed from within the profession or imposed upon it from without, that lessens the responsibility of the trained physician in the care and treatment of patients or denies him the rewards of individual effort and superior ability will, in the long run, be detrimental to the public welfare.' In the United States today hundreds of experiments in changing the nature of medical practice are under way. The development of the group seemed logical as soon as medicine began to be specialized. The committee on the cost of medical care of the American Medical Association has just completed a survey of groups. The medical profession has made no definite protest against such attempts to lower the cost of medical care.

"The system called contract practice includes numerous modifications, varying from the simple relationship between a physician who contracts with a single individual for a specified sum to take care of all of his medical needs during the years to the system whereby a corporation contracts with a group of physicians for a fixed sum to take care of all the medical needs of all employees and their families for a year.

At its best this is a debasement of scientific medicine. In the first place the responsibility of the physician is to the employer and not to his patient. In the second place the necessities of business rather than the needs of the patient dominate the picture. Cases are known in which a contract practitioner has had to see seventy patients in a single day. They almost had to meet him naked on their doorsteps if he was to provide anything more than a careless and perfunctory examination. The contractor must break even on his contract. Builders have been known to skimp materials and even to wreck buildings because they underbid.

"The judicial council formulated certain conditions that absolutely establish a contract as being unfair and unethical. Certainly when the compensation received is inadequate, as based on the usual fees paid for the same kind of service by the same class of people in the community; when the compensation is so low as to make it impossible to render competent service; when there is underbidding by physicians in order to secure the contract, and when a reasonable degree of free choice of physician is denied those cared for, contract practice is unfair, unscientific, unethical and harmful both to the public and to the medical profession.

"More than twenty-five nations are experimenting today on their people with what is called compulsory health insurance, the panel system, socialized medicine, communistic medicine and state medicine. There is not a single country in which the method there existing has been established as a success. Such methods represent standardization with the glorification of mediocrity. When human beings are put at a level in relation to any of the affairs of life, that level is invariably a low level. The philanthropist who wants to standardize medical care for the mass invariably has the best of highly personalized care for himself when he is sick. The personal physicians of Henry Ford, Edward A. Filene, John D. Rockefeller and Julius Rosenwald could no doubt recite some remarkable anecdotes of the medical idiosyncracies of these remarkable organizers of modern medical care. The social workers who direct the philanthropic activities of these enlightened leaders know where to pick the best of personal doctors for themselves. Moreover, when they do go into the clinics they somehow manage to get the kind of personal attention that is not generally bestowed upon the multitude.

"Among other experiments in medical practice are part-pay and over-pay university clinics, endowed hospital clinics, institutes for various diseases, and similar institutions. All are experiments that the medical profession will watch with interest. Today the profession holds fast to its view that medicine cannot be put on such a basis until human beings in general are robots.

"The American people have more automobiles than all the rest of the world together. They spend around a billion dollars annually for cosmetics, two billion for cigarets, and incredible sums for baseball games and motion pictures. Annually they put half a billion dollars into Christmas savings which they withdraw late in December and blow for knickknacks, pretties and radios. The medical bill of the nation is approximately three billions of dollars of which at least one billion is wasted on quacks and charlatans, on patent medicines and bogus apparatus. Around one hundred million dollars is spent annually on preventive medicine. To an intelligent reader such statistics need neither interpretation nor comment.

"Insurance authorities are convinced that voluntary health insurance could be sold to the American people at reasonable cost if only they could be educated to health insurance as they have been to life insurance. Under such a system there might be free choice of physician and sufficient funds to meet the bills for hospital care. Greater organization of physicians around hospital and laboratories would tend to lower the costs of the overhead.

"Physicians must not be debased to the position of salaried employees of the state, of insurance companies or of commercial organizations. That way lies the destruction of individual initiative, the lessening of responsibility, the lowering of standards and the reduction of a great profession to the cellars of oblivion."

THE AVAILABILITY, QUALITY AND COST of RURAL MEDICAL SERVICE

Interesting Statistics Issued by a Farm Magazine

The Farmers Wife, published at St. Paul, Minnesota, sent out a questionnaire to ascertain if possible the sort of medical service that is being given to rural communities. Eight hundred and sixty replies were received. The following detailed information, re-published in the *Bulletin of the American Medical Association,* should be of interest to all physicians. The figures are highly illuminating:

WHAT THE ANSWERS SHOW

1. Number in the family now at home:
   - Average ..... 4.64 persons
2. Distance to nearest doctor:
   - Average ..... 7.03 miles
   - 0- 4 miles ..... 39.7 per cent
   - 5- 9 miles ..... 40.0 per cent
   - 10-14 miles ..... 12.2 per cent
   - 15 miles or more..... 8.1 per cent
3. Time required by nearest doctor to reach the farm home in summer:
   - Average ..... 30.1 minutes
   - 0-14 minutes ..... 16.4 per cent
   - 15-29 minutes ..... 41.9 per cent
   - 30-59 minutes ..... 30.2 per cent
   - 1 hour or more..... 11.5 per cent
4. Time required by nearest doctor to reach the farm home in winter:

Average	56.3	minutes
0- 14 minutes	9.2	per cent
15- 29 minutes	24.0	per cent
30- 59 minutes	32.8	per cent
60-119 minutes	19.0	per cent
2 hours or more	15.0	per cent

5. Patronage of the nearest doctor:

Always	55.2	per cent
For emergencies and minor ills only	32.2	per cent
Never	12.6	per cent

6. Distance to doctor patronized, when he is not the nearest doctor:

Average	19	miles

7. Does the family doctor keep up-to-date?

"Yes" and "Reasonably so"	91.9	per cent
"No"	8.9	per cent

8. Distance to nearest ear, eye, nose and throat specialist:

Average	27.6	miles
0-14 miles	43.3	per cent
15-49 miles	41.5	per cent
50 miles or more	15.2	per cent

9. Distance to the nearest dentist:

Average	14.25	miles
0- 9 miles	61.9	per cent
10-19 miles	28.5	per cent
20 miles or more	9.6	per cent

10. Are nurses available for care of sick within 12 hours?

"Yes"	82.4	per cent
"No"	17.6	per cent

11. Distance to the nearest hospital:

Average	17.9	miles
0- 9 miles	28.7	per cent
10-19 miles	37.7	per cent
20-49 miles	28.5	per cent
50 miles or more	5.1	per cent

12. Time required to reach the nearest hospital in summer:

Average	49.1	minutes
0-20 minutes	25.0	per cent
30-59 minutes	36.9	per cent
1 hour or more	38.1	per cent

13. Time required to reach the nearest hospital in winter:

Average	97.1	minutes
0- 29 minutes	15.0	per cent
30- 59 minutes	27.4	per cent
60-119 minutes	30.3	per cent
120-179 minutes	12.8	per cent
3 hours or more	14.5	per cent

14. Distance to the nearest drug store:

Average	11	miles
0- 4 miles	33.6	per cent
5-19 miles	60.9	per cent
20 miles or more	5.5	per cent

15. Do the children have annual health inspections in school?

"Yes"	64	per cent
"No"	36	per cent

16. Persons doing these school inspections:
Nurses did all or some part of 68 per cent.
Doctors did all or some part of 42.4 per cent.
Teachers did all or some part of 13 per cent.
(In many instances, of course, doctors, nurses and teachers cooperated in making the inspections.)

17. Is health taught as part of school work?

"Yes"	75	per cent
"No"	25	per cent

18. Amount the doctor charges for a home call:

Average	$ 7.63	
$ 0- 4	38.8	per cent
$ 5- 9	37.8	per cent
$10-14	9.9	per cent
$15 or more	13.5	per cent

19. Amount the doctor charges for an office visit:

Average	$ 1.59	

20. Was the doctor called when the last baby was born?

"Yes"	95.7	per cent
"No"	4.3	per cent

21. Doctor's fee at time of last confinement:

Average	$28.33	
$25	32.7	per cent

22. Hospital bill at time of last confinement:
(149, or 17.3 per cent, of the 860 women replied)

Average	$74.12	
$ 0-49	34.9	per cent
$ 50-99	55.7	per cent
$100 or more	9.4	per cent

23. Amount paid the family doctor last year:

Average	$29.35	
No report	25.3	per cent
$ 1- 9	18.0	per cent
$ 10-24	18.1	per cent
$ 25-99	32.1	per cent
$100 or more	6.5	per cent

24. Amount paid other doctors last year:

Average	$19.23	
No report	64.0	per cent
$ 1- 9	10.9	per cent
$10-49	14.5	per cent
$50 or more	10.6	per cent

25. Amount paid the dentist last year:

Average	$19.23	
No report	34.3	per cent
$ 1- 9	24.5	per cent
$10-24	23.0	per cent
$25-49	10.0	per cent
$50 or more	8.2	per cent

26. Amount paid the hospital last year:

Average	$15.16	
No report	78.5	per cent

$ 1-24	5.6	per cent
$ 25-49	4.7	per cent
$ 50-99	6.7	per cent
$100 or more	4.5	per cent

27. Amount paid nurses last year:

Average	$ 5.25	
No report	88.5	per cent
$ 1- 9	1.2	per cent
$ 10-24	3.8	per cent
$ 25	5.5	per cent
$100 or more	1.0	per cent

28. Amount spent last year for medicines not included in doctor's fee:

Average	$ 7.21	
No report	29.1	per cent
$ 1- 4	21.3	per cent
$ 5- 9	20.8	per cent
$10-19	19.8	per cent
$20 or more	9.0	per cent

29. Amount spent last year for extra help on account of sickness:

Average	$ 6.86	
No report	79.5	per cent
$ 1-24	11.3	per cent
$25-49	5.1	per cent
$50 or more	4.1	per cent

30. Amount of other expense due to sickness last year:

Average	$ 6.82	
No report	85.8	per cent
$ 1-24	7.8	per cent
$25-49	2.8	per cent
$50 or more	3.6	per cent

31. Total expense due to sickness during the last year:

Average	$104.94	
No report	6.7	per cent
I 1- 24	24.0	per cent
$ 25- 49	19.4	per cent
$ 50- 99	19.2	per cent
$ 100-199	17.2	per cent
$ 200-499	10.7	per cent
$ 500-999	2.0	per cent
$1,000 or more	.8	per cent

The following table shows how the farmers health dollar is spent:

Family doctor	$0.28
Other doctors	.183
Dentist	.144
Hospital	.144
Nurses	.05
Medicines not included in doctor's fee	.069
Extra help on account of sickness	.065
Other expense due to sickness (loss time wages etc.)	.065
Total	$1.00

In the figures given in the foregoing pages have appeared averages for each item of cost, based on returns from 860 families. The following table summarizes these averages in its first column of figures, and gives in the second column other averages based on the number of families who actually spent something for the respective items. This number of families is given in the third column.

For example, the average hospital expense last year for the 860 families was $15.16, but for the 185 families who had a hospital experience the average was $70.46.

Item	Average based on 860 families	Average based on No. of families in Col. 3	No. of families answering question
Family doctor	$29.35	$39.14	645
Other doctors	19.23	52.35	316
Dentist	15.06	22.92	565
Hospital	15.16	70.46	185
Nurses	5.25	45.57	99
Medicines not included in the doctor's fee	7.21	10.17	610
Extra help on account of sickness	6.86	33.53	176
Other expense due to sickness (lost wages, time, etc.)	6.82	48.09	122

BERMUDA AFTER THE A. M. A. CONVENTION

Here is a vacation trip that can be obtained with the American Medical Association Convention, that contains everything you have wanted.

The trip reveals at their best, the attractions of the Bermudas, one of the loveliest islands in the world. Bermuda, the island of perpetual springtime, is 675 miles southeast of New York reached in 48 hours of delightful sailing on the splendid and popular ships of the Furness Bermuda Line.

Frost is never known in Bermuda. The climate is mild and friendly owing to its latitude and to the influence of the nearby Gulf Stream.

Rich in scenic beauty both on land and in the surrounding waters; a paradise for sportsmen who find their pleasure in boating, fishing and all water sports; in golf and tennis, riding and a score of other activities on shore, Bermuda is a playground without equal in all the world.

Every detail of our trip has been arranged for, so that all the worries of travel will be taken off your hands. We will use the famous Motor Vessel Bermuda for this tour, which takes 6 days, 2 days each way at sea and 2 days in Bermuda. Those who desire to remain longer, can do so at the additional expense of the hotel, for the balance of their visit, as the Furness Bermuda Line maintains twice weekly service to and from Bermuda.

Lovers of tennis or golf will find ample opportunity to indulge in these sports on the island. Aside from the courts attached to our large hotel, there are a number of private tennis clubs and a number of golf courses that will all be available to our members. Conditions for boating, bathing and fishing are ideal. With a native pilot one may navigate the sounds and harbors, ex-

plore the uninhabited isles nearby and visit the headlands and bays that will not be accessible by roads.

Every evening while on the ship and in Bermuda, there will be dancing and a program of sightseeing has been arranged for those who desire to spend their time visiting the scenic beauties of Bermuda.

No passports are required for this trip, although Bermuda is a British Colony and thus a "Foreign Land." Bermuda has two delightful little towns; Hamilton, the capital, is a charming picture of white houses glistening in the bright sunlight, with many quaint English shops. St. Georges, with its quaint streets, was settled in 1612, three years after the Islands were claimed as a British passession by a group of colonists under Admiral Sir George Sommers, who were shipwrecked here on their way to Virginia.

A person who wants quiet and rest during his stay can find it any place on the islands. There are no clattering trolley cars, no whirring honking automobiles. The visitor imagines himself transported, as if by magic, to the quieter, less nerve racking and more dignified days of the past Century.

For descriptive booklets regarding this tour, write Messrs. Braude & Nasi, Tour Directors, 501 N. Wells Street, Chicago.

BEWARE THIS SOLICITOR

St. Joseph, Mo., March 30, 1931.

To the Editor: On February 23, this year, a solicitor victimized a number of physicians in St. Joseph. His plan was to solicit subscriptions to Harpers and other magazines and to offer sets of books as premiums. The subscription blank called for the payment of $9.70 in ninety days. He was supplied with blanks, samples of binding and everything to indicate that he was a bona fide magazine salesman.

After he had secured the signature on the subscription blank, he explained in an indifferent manner that if the subscriber cared to pay cash, or by check, there was a discount of $1.00, and the check could be made payable to "Harper Brothers Publishing Co.," the name printed on the subscription blank. The doctors "fell for it" and the next day he cashed the checks at a local bank and departed. He used the name T. T. McLean while here but has also used the name Leroy Dale.

Correspondence with the National Publishers Association, 15 West 37th St., New York, indicates that this person has been defrauding physicians in the Middle West for several months.

YOU ARE INVITED TO ATTEND OUR CANCER CLINIC

Dr. Joseph Colt Bloodgood of Johns Hopkins University, Baltimore, will conduct a morning and afternoon clinic, showing Bone Tumors and other new growths, at a meeting of the Radiological Section of the Wisconsin State Medical Society, Schroeder Hotel, Milwaukee, May 27, 28 and 29.

Presentation of cases will be by lantern slides and include the following material: 1. Short clinical history (diagnosis omitted), 2. Photographs, 3. Radiographs, 4. Microphotographs, 5. Serial radiographs of cases treated by radiation.

Members of the Illinois State Medical Society are cordially invited to attend this meeting and show their interesting Bone Tumor cases at the clinics. Send us a list of the cases you desire to show.

Program of meeting, hotel reservation, and other information on request.

Frank W. Mackoy, M. D., Secretary,
Sacred Heart Sanitarium,
Milwaukee.

THE POLICY OF INTERFERENCE WITH THE PHYSICIAN AT THE SICK BED IS UNCIVILIZED

THE LAW AND THE DOCTORS

The American College of Physicians, meeting in Baltimore, voted a protest against the restrictive laws which interfere with their prescription of drugs and alcohol. The law, depriving the physician of discretion, denies reputability to the profession and endeavors to take from the patient the aid or relief which the doctor would give him. The restriction is based upon the assumption that the medical profession would go out of hand and become a social menace if it were permitted freedom of prescription.

If this assumption is not slanderous then the country is in a bad way, indeed, its sick being dependent upon professional men and women who would turn bootleggers and drug peddlers if the law did not police their medicine cases and prescription pads. In this respect the drug restrictions are even more barbaric than the whisky and malt limitations. They are the products of jaundiced minds gone quite off the handle in a voodooistic ecstasy.

The Wickersham commission hit the medical liquor restrictions as indefensible. The whole policy of interference with the physician at the sickbed is uncivilized. It is a part of the witch hunt, something out of an unbalanced mentality.—*Chicago Tribune.*

SOME RECENT OPINIONS ON ANIMAL EXPERIMENTATION

Charles W. Eliot, LL.D., Pres. Emeritus, Harvard University:

We owe to scientific experimentation on animals the means of saving hundreds of thousands of children within the past fifty years, and untold millions of children in the coming years. But it is not human beings alone that owe an immense debt to modern animal experimentation. Animals also owe to vivisection great deliverance from disease and death. All the agricutlural industries in the United States are deeply indebted to animal experimentation.

Harry Pratt Judson, until recently President of Chicago University, Chicago, Illinois.:

Men of real scientific attainments must not be pre-

vented from pursuing their investigations for the benefit of humanity by idle sentimentality.

His Eminence, Denis Cardinal Dougherty, Archbishop of Philadelphia, Pa.:

To forbid vivisection would be to hamper science, do a mischief to the human race, and foster misplaced sympathy.

Rt. Rev. C. H. Brent, Bishop of Western New York:

I sincerely hope that the efforts made by the anti-vivisectionists to eliminate this mode of scientific investigation will not meet with success.

Rev. John Haynes Holmes, Minister of the Community Church, New York:

As regards the surgeons who are engaged in this business of vivisection, I have to state that I do not believe for a single moment the charges that are so wantonly brought against them. I know some of these men. I have met the most distinguished of them, who has been for years under most virulent attack. I have gone through his laboratories, I have witnessed his performance of a vivisection experiment, which was of the character of most severe major operation. To accept the charges of cruelty against scientists of this type—this is a thing impossible to me.

Ernest Thompson Seton:

I learn now from your reply to the Baynes article that you are opposed to all experiments on living animals, and that you utterly condemn the work of the Pasteur Institute, the Rockefeller Institute and allied laboratories. I have to thank the studies of such institutions for the fact that my wife is alive today. Kindly accept my resignation from the Vivisection Investigation League, to take effect immediately.

Col. David S. White, Chief Veterinarian of the American Expeditionary Forces:

Anyone who is familiar with what vivisection has done for mankind and animal kind must realize its value to the world.

William J. Mayo, M. D., The Mayo Clinic, Rochester, Minn.:

My brother and I are strongly in favor of vivisection. In the clinic there are large laboratories in which a number of physicians are constantly at work on investigations which depend on animal experimentation.

President Angell of Yale University:

We find no obstacle to the practice of animal experimentation in any intuitive moral convictions, nor in the traditional morality of our race.

What Science Has Done For the Dog

1. We can now prevent and cure *rabies* in the dog.
2. We can now kill the *hookworm* which infests dogs as well as man and which makes it difficult for dog fanciers to raise dogs in the South.
3. We can now prevent and cure *blacktongue* in the dog.
4. We can do much to prevent and control *distemper*. The treatment is not perfect and further experiments must be done on the dog for the good of the dog.
5. We are now working to find a medicine that will kill the cruel *heartworm* in the dog.
6. We know how to operate on the dog and cure certain diseases of the thyroid gland and intestines.
7. We are learning about "puppy birth" in the dog which is important to dog fanciers.
8. We can prevent diseases in the dog due to improper food. Dogs need vitamines just as other animals do.

What Has Antivivisection Done for the Dog?

1. Nothing. Antivivisection would prevent experiments on dogs for the sake of the dog. House Bill 453 would make it impossible for Veterinary Science to experiment on one dog for the sake of dogs as a group.

The leading Veterinarians are against this Bill: Dr. Robert Graham, University of Illinois; Dr. J. V. La Croix, Editor, North American Veterinarian, Evanston, Illinois; Dr. Maurice Hall, Bureau of Animal Industry, Washington, D. C.; Dr. John P. Turner, American Veterinarian Association; Dr. W. H. Welch, Chief Veterinarian, Illinois State Department of Agriculture, Springfield, Illinois and others.

A letter will follow telling what experimentation on dogs has done for man.

SOME INFORMATION RELATIVE TO VITAMINS

It is claimed that persons not receiving sufficient Vitamin A in their diet have discharges from their nose and sinus passages similar to the discharges of the latter stages of a common cold.

Vitamin A is found in egg yolk, milk, cod liver oil, and vegetables, such as lettuce.

Pyorrhea and tooth troubles associated with it may have the same cause as scurvy, a disease due to lack of Vitamin C, and occurring from insufficient fruits and vegetables in the diet.

How the four other known vitamins aid in maintaining human health: Vitamin B. found in root crops, greens, fruit, and yeasts, prevents beri-beri. Rickets, a disease of young children, is due to lack of Vitamin D, which is present in cod liver oil. Vitamin G, supplied by milk, lean meat, eggs, and vegetables, prevents pellagra. Vitamin E, occurring in white wheat and lean meat, seems to be essential to reproduction among rats.

MIMICRY OF PEPTIC ULCER

The symptoms of peptic ulcer are often simulated by other lesions and occasionally the mimicry may be very confusing. The cardinal symptoms, hunger pain and hemorrhage, are, however, usually associated with other evidence that may lead to a correct diagnosis. In the atypical cases of peptic ulcer, in which both hunger pain and hemorrhage are absent, and in cases simulating peptic ulcer, the diagnosis may be extremely perplexing and will require the combination of a careful clinical observation, a thorough laboratory study and a competent roentgenologic examination in order to determine the facts.—Dr. J. Shelton Horsley, Richmond, Va., in *Illinois M. J.*, Aug., 1929.

Original Articles

THYROIDECTOMY FOR THYROTOXICOSIS IN PATIENTS BEYOND THE FIFTIETH YEAR*

J. M. MORA, M. D.,
AND
E. I. GREENE, M. D.
Instructors in Surgery, University of Illinois College of Medicine and Northwestern University Medical School, respectively
CHICAGO

This report deals with a study of 200 thyrotoxic patients 50 years and older who were subjected to thyroidectomy. These cases occurred in a consecutive series of 1,060 patients operated upon for toxic goiter—18.8%. In other words, nearly one-fifth of the entire series consisted of patients fifty years of age or older. One hundred and fifteen (57.5%) were between 50 and 55 years, 38 (19%) between 56 and 60 years, 32 (16%) between 61 and 65, 12 (6%) between 66 and 70 years, and 3 (1.5%) were over 71 years. Of the latter three, two were seventy-six years old, and one 73, at the time of operation. The average age of the 200 cases was 56.6 years. There were 55 males and 145 females. This is somewhat below the usual proportion of women to men, which is usually given as 4 or 5 to 1.

The series comprised 133 cases (66.5%) of so-called primary hyperthyroidism (hyperplastic thyroids) and 67 (33.5%) cases of secondary hyperthyroidism (toxic adenoma). The period of duration of goiter varied from one month to fifty years. One hundred and nine patients were not aware of any thyroid enlargement; four were indefinite as to the exact duration; in the remaining cases in which definite data were obtainable, the average duration was 11.68 years.

The duration of symptoms varied from two weeks to 32 years, the average duration of the entire series being 23.2 months. In 44 cases, where there was some accuracy as to the knowledge of the interval between the appearance of the goiter and the onset of symptoms, the average interval was found to be 14.5 years. In one case, the interval was 50 years. In twenty-five instances, the goiter and symptoms appeared coincidently. In one case, the symptoms preceded the appearance of the goiter by seven and one-half years.

Study of the symptoms (subjective and objective) reveals some interesting facts. The outstanding symptoms were weight loss (84.5%), tachycardia (73%), nervousness (67.5%), tremor (55.5%), weakness (43%), palpitation (41.5%), and exophthalmos (29%). Other less frequent and pronounced symptoms occurred as noted in Table 1. The question of weight loss is extremely interesting. It was the preponderant finding in our series. The weight loss in some of our patients was unusual—one patient lost 54 pounds in one month, another 40 pounds in one month, a third 45 pounds in five weeks, a fourth, 90 pounds in seven months; a fifth patient, while in the hospital being prepared for operation, lost seven pounds in eleven days in spite of every attempt to increase the caloric intake. The average weight loss in 135 cases in which accurate data were obtainable, was 31.2 pounds.

Bilateral exophthalmos was noted in 58 cases (29%); three cases exhibited unilateral exophthalmos—in two cases the left eye protruded, and in one case the right eye was involved.

The cardiac manifestations in this series were distributed as follows: 73% had tachycardia, 42.5% showed left heart enlargement on physical examination, 41.5% complained of palpitation; dyspnea was present in 22%, a systolic blow at the apex in 17.5%, while pre-operatively, 15% had auricular fibrillation. Cardiac decompensation was noted in 12% of the series; right heart enlargement, precordial distress, systolic and diastolic murmurs, paroxysmal tachycardia, gallop rhythm, and pulsus bigeminus were found in a smaller number of cases. Of the 85 cases with left heart enlargement, 25 showed persistence of the left ventricular hypertrophy after operation, all occurring in hearts which had been damaged. Of 30 cases of auricular fibrillation, 27 were restored to normal rhythm, post-operatively. Blood pressure readings corroborated what has been well established regarding a somewhat higher than normal pulse pressure. In this series, the average systolic pressure was 160 mm. of mercury, the average diastolic 80 mm. the average pulse pressure being 80 mm.

In 21 cases specific inciting factors were

*From the surgical service of Dr. H. M. Richter.
†Read before Section on Surgery, Illinois State Medical Meeting, May 20, 1930.

noted—five appeared to be of psychic origin, 16 of physical origin. The latter included acute infections and surgical procedures, and are tabulated in Table 2.

Our series comprised 58 cases of bilateral exophthalmos and three cases of unilateral exophthalmos. All but five returned to normal. In four instances the lesion became more marked following operation.

One-third of our patients had been treated medically over varying periods of time—in some instances amounting to several years—before coming to surgery. These therapeutic agents included the prolonged and indiscriminate use of iodine, radiotherapy, digitalis, thyroidectomized serum, thyroid extract, and the various "rest cures." Medical management was apparently ineffective, and it was only after adequate thyroidectomy that these patients were restored to normal.

In the 200 cases reported we were able to obtain accurate preoperative basal metabolic rates in 199. In the remaining case, we were unable to obtain an accurate reading because of extreme nervousness and poor cooperation. There were 591 preoperative metabolic readings in the 199 patients, an average of 2.97 rates per patient. The average preoperative basal rate was 41.6 (plus).

Without exception we noted a definite response to iodine in every case, despite the fact that in 20 cases the metabolic rate increased, with, however, distinct clinical improvement. Of these 20 cases, 14 were of the primary hyperplastic type, while 6 were nodular goiters. We also noted 26 cases in which the preoperative use of iodine made no appreciable change in the basal rates; 14 were adenomatous goiters, the remaining 12 being hyperplastic thyroids. Apparently the type of goiter was not the factor in the response to iodine.

Post-operative studies reveal the following: of the 200 cases, we were unable to obtain metabolic studies in 25 patients—there were six deaths—18 patients were unable to return for various reasons and we were unable to follow-up one patient because of a serious mental aberration. Accurate metabolic rates were obtained in the remaining 175 cases, the total number of readings amounting to 511, an average of 2.8 rates per patient. The average post-operative basal rate was —1.1.

Four of the 175 cases have post-operative readings over +15. The first one with a +21 had a marked cardio-vascular-renal degeneration, a second with +16 relieved of her thyrotoxicosis, also has serious cardiac damage. The other two patients both clinically toxic have refused to cooperate for further study.

Post-operative hypothyroidism lasting from a few weeks to six or eight months were noted in 64 patients; five cases of mild temporary tetany were noted. There were six cases of temporary post-operative recurrent nerve trauma—two cases of persistent damage.

We have included in this series, seven so-called recurrent cases—four of these had been operated on elsewhere, three on this service. These cases do not represent relapses; they are cases of persistent hyperthyroidism, unrelieved because of inadequate surgery. In every instance, reoperation resulted in a return to normal of the basal metabolic rate.

There have been six deaths in this series of 200 cases. One death occurred in the remaining 860 cases under 50 years of age, which comprised this series. The total mortality of the entire series of 1,060 consecutive thyroidectomies for hyperthyroidism is 0.66%.

TABLE 1. SYMPTOMS ENCOUNTERED IN 200 CASES OF THYROTOXICOSIS IN PATIENTS OVER FIFTY YEARS OF AGE

	Cases	Per cent.
Weight loss	169	84.5
Tachycardia	146	73.0
Nervousness	135	67.5
Tremor	111	55.5
Weakness	86	43.0
Left heart enlargement	85	42.5
Palpitation	83	41.5
Irritability	60	30.0
Bilateral exophthalmos	58	29.0
Dyspnea	44	22.0
Systolic blow	35	17.5
Auricular fibrillation	30	15.0
Heat intolerance and excessive perspiration	26	13.0
Cardiac decompensation	24	12.0
Polyphagia	14	7.0
Right heart enlargement	12	6.0
Nausea and vomiting	11	5.5
Fatigability	10	5.0
Restlessness	10	5.0
Diarrhea	9	4.5
Crying spells	9	4.5
Extrasystoles	8	4.0
Precordial distress	7	3.5
Dizziness	6	3.0
Sleeplessness	5	2.5
Psychoses	3	1.5
Systolic and diastolic murmurs	3	1.5
Crises	2	1.0
Dysphagia	2	1.0
Left exophthalmos	2	1.0

Right exophthalmos	1	0.5
Pigmentation	1	0.5
Paroxysmal tachycardia	1	0.5
Gallop rhythm	1	0.5
Diabetes	1	0.5
Pulsus bigeminus	1	0.5

TABLE 2. PRECIPITATING FACTORS IN 21 CASES OF THYROTOXICOSIS IN PATIENTS OVER FIFTY YEARS OF AGE

	Cases
Influenza	5
Nasal operation	1
Cataract operation	1
Acute laryngitis	1
Lobar pneumonia	1
Acute sore throat	2
Hemorrhoidectomy	1
Unusual mental stress	5
Financial reverses, 1 case	
Death in family, 4 cases	
Peritonsillar abscess	1
Acute appendicitis	1
Tonsillectomy	1
Radiotherapy	1

180 N. Michigan Ave.

HYPERPLASTIC SINUS DISEASE IN RELATION TO RETROBULBAR NEURITIS*

SAMUEL G. HIGGINS, M. D.
MILWAUKEE, WIS.

Two hundred and three cases of retrobulbar neuritis were seen among 64,200 patients examined at the University of Tübingen in the years 1921 to 1928. The incidence reported by Scheerer is 0.3 per cent of retrobulbar neuritis among these eye patients. Affections of the nasal sinuses were present in three cases or 1.3 percent. Among 28,000 patients seen in the eye clinic at Zagreb, there were twelve cases of retrobulbar optic neuritis of nasal sinus origin.

In a study of twenty-four cases of retrobulbar optic neuritis made by Feigenbaum and Salzberger nineteen were of sinus origin of which sixteen were operated on. In the sixteen operative cases no gross or microscopic changes in the sinus membrane were found. They felt that a much higher percentage improved after operation and they advised opening the ethmoids and sphenoids.

The references to these reports in foreign literature during the past year reflect investigations inspired by more frequent cases of retrobulbar neuritis associated with hyperlastic sinusitis reported in the American journals. While the frequency is rare the entity of hyperlastic sinus disease and retrobulbar neuritis is confirmed.

The close anotomical placement of the posterior ethmoidal sinuses and sphenoidal sinuses to the optic canal has been demonstrated by W. Blake Gibb, Knapp and others. The hyperplasia is described as a chronic, low grade, local inflammation with production of excessive connective tissue with edematous thickening of the mucosa of a catarrhal nature. Vail's statement is "hyperplasia of the sphenoid or ethmoid bone is a rarefying osteitis associated with inflammatory swelling and fibrous thickening of the mucous membrane lining their cavities, causing edematous tissue to fill them without formation of pus; the limiting wall called the capsule, is also thickened and the orbital wall is involved as well as the nasal." Peter explains the spread to the optic nerve by direct extension or by means of the posterior vein of Vossius which receives tributaries from the nose and posterior part of the orbit. "He showed that production of the enlarged blind spot could be accounted for by direct extension affecting the peripherial portion of the nerve which supplies the area of the retina immediately surrounding the disk, and that the central scotoma was caused by toxic material carried through the blood stream to the papillomacular bundle in the center of which lies the vein of Vossius." Herzog believes that the inflammation extends along vessels and lymph channels through the medullary spaces in the intervening bone, producing an inflammatory edema of the optic nerve sheath. Feigenbaum concurs in this explanation.

The patients seen by me observed diminished vision in one eye. Their foggy vision progressed within two or three days to 20/100 or 20/200 at the time of my examination. Cases are reported in which vision declines within a few days to loss of light perception. Early the only symptom is diminished vision with no pain nor objective signs of disturbed pupillary reaction nor distressed ocular movements.

The following is a typical case:

Mr. J. A. C., aged 30 years, linotype operator, came to me January 27, 1928. The vision of the right eye was blurred. The blur was noticed two days before and as it did not improve he sought relief. He had a slight general headache somewhat localized frontal and

*Read before Section on Eye, Ear, Nose and Throat, Illinois State Medical Meeting, May 21, 1930.

supraorbital. There was some pain in the eye or back of the eye. He had used his eyes much, often with overtime work at night. He had a cold recently but the nasal discharge was clear and watery. No pus was noticed by him nor seen by me. He said he did not have a cold the day he came in. The other eye has not bothered him and he was seeing with it the same as usual. He was wearing glasses constantly which were obtained one year previously, right eye +0.50+0.50, axis 90 degrees, left eye +0.50+0.75, axis 90 degrees. Vision of the affected right eye was 20/200; of the left eye 20/50. Manifest refraction showed no improvement of vision of the right eye with glasses. Vision of the left eye with glasses, +0.25+0.50, axis 90 degrees, was 20/20 minus one #.

The visual field taken on the day he came in showed but slight contraction of the limits of the field but there was marked central blurring for white, green and red.

The external eye and media were clear. Having in mind the poor vision I fancied there was slight pallor of the whole disk more marked in the temporal half.

Examination the following day under homatropine and cocain gave vision right eye 20/200, left eye 20/70, with lenses right eye +1.25+0.25 axis 90 degrees vision 20/100, left eye +0.50+0.50 axis 75 degrees vision 20/15. General physical examination by the family physician was negative including laboratory tests and Wassermann.

Nasal examination was essentially negative. No pus could be seen before or after shrinkage. The sinuses were x-rayed on the day he came in. General nasal irrigation was returned clear. X-ray report stated pathology was present in both ethmoids. Argyrol and adrenalin packing was continued daily without improvement. On January 31, four days after the first examination, I opened the ethmoidal sinuses of the right side. This was done as conservatively as possible beneath the middle turbinal bone.

February 17, 1928. Examination under homatropine and cocain showed vision right eye 20/65 but with glasses +0.75+0.37, 90 degrees 20/20#; vision left eye 20/65 with glasses +1.00+0.37 axis 90 degrees 20/20#.

April 14, 1928. Some blurring of vision was again noticed in the right eye. The blur subsided after 3 or 4 nasal treatments. Patient was last seen January 20 of this year when vision was normal with glasses.

As the disease progresses the pupil of the affected eye is often dilated and contracts sluggishly to light. In severe cases the pupil may be considerably larger than in the other eye and the pupillary reflex may be lost. A peculiar headache frequently develops which is described by the patient as a pain in the back of the eye. Pain may be mentioned on extreme movements of the eye.

The external eye is clear. The media are clear and negative throughout. The fundus is essentially negative. Some observes report tortuosity of the vessels and later some blurring of the disk.

It would be a fatal mistake in a case of marked diminished vision to wait for something to be seen in the disk. Reports of retrobulbar neuritis associated with hyperplasic sinusitis from all over the world can not be wrong. The entity of this condition can be established when present in your patient.

Examination of the field of vision was known to physiologists. Von Graefe was the first to apply this means to diagnosis of disease of the eye. When other signs are not indicative the mapping of the visual field is as essential a part of our examination as that of the routine use of the ophthalmoscope. In the study of retrobulbar neuritis associated with hyperplastic sinusitis the visual field is a means of differential and the means of pathognomic diagnosis. The distinctive feature is central scotoma. This at first is usually small and separated from the blind spot but later may include it. In severe cases the peripheral fields may be greatly contracted. The field of the unaffected eye is normal.

We may remember central scotoma by recalling Herzog's explanation of the pathologic nature of this disorder. The pressure is from the edema of the optic nerve sheath upon the nerve itself and is equal upon the center of the nerve and on the periphery. The fibres supplying the macular region are the more delicate and sensitive and are therefore the first affected.

Before defining the plan of treatment one must consider the differential diagnosis of confusing conditions and causes.

Toxic amblyopia is gradual in onset with a history of habit of long continued drinking and smoking or over doses of drugs such as quinine. Small central scotoma may be found for colors but both eyes are involved; though one eye may be more affected than the other.

Congentital amblyopia is not progressive; the loss of vision in one eye may be suddenly noticed; it is often associated with a marked error of refraction.

Hysteria may be differentiated by the history, other signs of hysteria and tubular or over lapping visual fields.

Malingering may be excluded by tests for this condition.

It is important to differentiate the causes of

retrobulbar neuritis. The higher percentage is assigned to multiple sclerosis. The neuritis may be the first observed symptom of this disease. Further search may find a peculiar nystagmus on fixation, the presence of a paralysis of one of the extremities, with a fine tremor. Both eyes are usually affected in multiple sclerosis but not always. Retrobulbar neuritis following systemic infections will give the history of scarlet fever, typhoid fever or the acute infectious diseases; both eyes are usually involved. Urinalysis may indicate albuminuria or diabetes. Lues must always be considered as an important cause. Among other mentioned causes are anomalies of menstruation, pregnancy, lactation, acute loss of blood. Heredity and idiopathic causes are mentioned with the group of causes unknown.

Rheumatism has long been considered an active factor and antirheumatic treatment has often been of great value. After focal infection such as pathologic tonsils or apical abscesses the loss of vision is not so progressive and the fields do not show central scotoma; definite neuroretinitis is more apt to develop. Toxic absorption from body burns has excited retrobulbar neuritis. A history of a recent cold may direct our attention to the sinuses and the suppurative sinusitis may be the cause. Distinct optic neuritis observed with the ophthalmoscope while closely related to our problem is another story. The border line type of disease with similar etiolgy may influence our plan of treatment.

The diagnostic sign most indicative of sinus origin of acute retrobulbar neuritis is central scotoma of the visual field. Careful x-ray examination may add weight to the diagnosis. Information regarding the anatomy, location and size of the sinuses may influence the treatment as well as the diagnosis. Lipiodyl injections in the sinuses before taking the roentgenograms may determine the size and proximity of the sinuses to the optic canal. P. Watson Williams has detected anomalies by his "differential test" of irrigation with a fine canula.

In my opinion treatment should begin the hour the patient is seen. The method of nasal examination fortunately is also therapeutic. Steindorff advises against delay in treatment. Also he believes Herzog's daueranemia treatment to be of great aid in differential diagnosis. Feigenbaum agrees with Herzog's theory of the direct spread of the infecting agents through the narrow spaces of the bone. He uses Herzog's treatment with good therapeutic results but feels that operation should be performed in severe cases.

The patient has unknowingly delayed treatment until vision has become bad. With good vision in one eye and no other disturbance he may become aware of the failing vision quite incidentally and suddenly. Topical applications of ephederine as a part of nasal examination reduces the swelling and edema. Herzog's application of argyrol with adrenalin or ephedrine further reduces the edema and may be sufficient to relieve the neuritis. One should proceed with the careful taking of the history and not delay the taking of the visual fields. As medical treatment is often successful in these cases it appears unwarranted to operate before the positive diagnosis is made. It would be presumptive to diagnose retrobulbar neuritis associated with hyperplasic sinusitis without central scotoma in the visual field. (In my opinion the patient should be treated as well as the supposed pathology.)

Medical treatment may be continued while making the diagnosis. May there not be systemic disorders causing the hyperplastic sinusitis? The effects of focal infection, idiopathetic or rheumatic conditions yield to medicinal measures. May not both retrobulbar neuritis and hyperplasic sinus disease be symptoms as well as pathologic entities? Elimination and salicylates are at least old and tried remedies. Would you not be chagrined to have operated on a patient whose later symptoms permitted the diagnosis of multiple sclerosis? Differential diagnosis is important, pathognomonic diagnosis is established by scotoma in the visual field, treatment is urgent. You are both the physician and the specialist.

The more frequent diagnosis of this condition in this country may be accounted for by the general discrimination of information regarding health problems. This in turn permits the physician to apply his scientific methods. More frequent use of the perimeter with careful scotometric study will establish more exact diagnosis with appreciation by the patient and credit to his consultant.

Wells Building.

HYPERESTHETIC RHINITIS AND ASTHMA DUE TO DIGESTIVE FERMENTS*

WM. L. BEECHER, M. D.
Associate in Medicine, Loyola University School of Medicine. Department of Immunology, The Postgraduate Hospital and Medical School.
CHICAGO

Progress in the study of allergic disease is proceeding along many lines with much valuable information being produced. Much of this progress is made by the research worker. Important as research work is, it can not and does not lessen the need for clinical work. A part of this necessary clinical work is the detection of hitherto unknown substances capable of producing disease reactions. Although the greater number are probably known now, it is likely that there are still many unknown. One of the possible sources are the metabolic products of the patient's own body. The antigenic possibilities of the partially digested proteins of our foods and the products of bacterial action on both foodstuffs and body proteins must also be considered.

In the light of the case to be reported tonight we must also consider the possibility that when digestive enzymes are applied to tissues not normally protected against their action, or tissues deprived of normal protection, these tissues may be so altered that they become, in effect, foreign proteins. If such alteration does occur we can expect the development of a sensitization towards them in some individuals who are by inheritance or otherwise capable of such development.

The patient, a druggist, was referred to me in April, 1929, with a history that in October, 1924, he began to have, as he thought, a series of "colds" which soon became practically continuous. Sometimes a few days elapsed between the attacks of sneezing, itching of the nose and nasal discharge. Later asthma also began to trouble him. After a year or two he arranged for an operation on his nose because he was told his trouble was due to a deflected septum and enlarged turbinates. At the same time he was advised to take KI. This produced so much immediate relief that the operation was deferred. After a few weeks the relief was somewhat less and he began to take calcidin. He continued to use either KI or calcidin with partial control of symptoms until near the first of the year 1929. At that time his local physician sent him to a nose and throat specialist who operated on his septum and turbinates. The resulting better air drainage produced considerable improvement in the symptoms. However, his sneezing continued and the asthma troubled him very much. The asthma was especially bad on exertion, such as stair climbing, etc. His physician now examined him and found a typical allergic nose. He accordingly referred him to me for diagnosis.

On taking his history I learned that two brothers and a sister were victims of hay fever. He stated that his symptoms were especially bad when he was filling prescriptions. He suspected papain and caroid, digestive ferments made from the tropical fruit, carica papaya, also the proprietary digestive ferments peptenzyme and lactopeptine as causes of his trouble. He had in fact asked his local physicians not to prescribe them in powder form. He stated that he was better since they had stopped prescribing them.

Skin tests were made by the cutaneous method with results as follows:

Papain	2 Plus	Eggs	Doubtful
Lactopeptine	Doubtful	Pancreatin	2 Plus
Duck Feather	Doubtful	Peptenzyme	1 Plus
Scale Pepsin	2 Plus	Lycopodium	1 Plus
Caroid	1 Plus	Pork	Negative
Goose Feather	1 Plus		

Many other tests were made but will not be reported here because they were negative. The tests with pepsin and pancreatin were made because both peptenzyme and lactopeptine contain these ferments though in larger proportion in peptenzyme. This larger proportion accounts for the more marked reaction to peptenzyme. The test with pork was made because of the origin of pepsin and pancreatin.

On witnessing the marked reaction to papain the patient volunteered the information that he had recently tasted a solution of caroid and as a result he had a swelling of his lips.

The test with lycopodium was made because he used frequently in dispensing, and I thought it likely that he might have developed a sensitization to it.

Although his trouble was much worse when in his pharmacy he was directed to sleep without

*Address before the Chicago Society of Allergy, February, 1930.

a feather pillow and to avoid eggs. Since it was difficult to entirely avoid the digestive ferments an attempt to desensitize against peptenzyme and papain was advised. His physician was furnished with solutions of the ferments for the purpose. The first injection of papain in a dose of .1 cc of the 1-10000 solution caused an intense local reaction on the arm and the dose had to be reduced to less than one-fourth that amount. After that no trouble was reported.

Present conditions: He is very much improved in every way. His general health is good. His nasal and bronchial troubles are very slight, although he is still sensitive enough to have symptoms if he fills a prescription containing the ferments in powder form. He does not have any trouble if he does not personally dispense them.

He stated to me recently that he suspected that he had developed a sensitization to flaxseed. I therefore tested him with flaxseed protein and obtained a small reaction. Since Grafton Tyler Brown[1] had reported greater reactions with flaxseed meal than with the proteins, I made a test with that. The result was a 2 plus reaction.

In the available literature I have found references to allergic reactions to papain but no particulars of the cases were given. I have failed to find any instance where the symptoms led to a suspicion that either pepsin or pancreatin was an etiologic factor, nor any case where they were tested.

It seems probable that allergic reactions to these various ferments may be quite common since I have had verbal reports of three other druggists in Chicago who have asthma from caroid and one from peptenzyme. In this connection I had a report from a physician that he had a patient who developed cramps and diarrhoea immediately after taking a dose of essence of caroid. Repetition of the dose was refused so coincidence could not be ruled out. However, this incident and the cases noted above makes it advisable that we keep allergy to these ferments in mind as a possible cause of disease conditions. It may also be the factor in otherwise unexplained drug disagreements. The offenders may be the digestive ferments present in the vehicles we use so often in our prescriptions.

1. Grafton Tyler Brown: Linseed Meal Sensitization, Annals of Internal Medicine, Vol. 4, pages 601-602, Dec., 1930.

Note: Since reading the above report I have been informed of two additional cases of sensitization to caroid. One case was that of a druggist who had asthma whenever he dispensed powdered caroid. On two occasions the proprietor of the store returned to find him unconscious as a result of an acute attack.

The other case took a single dose of a mixture of caroid with soda bicarbonate. He almost immediately had an attack of urticaria and also angioneurotic edema of the face with great interference with breathing. Whether the dyspnea was due to asthma or to edema of the larynx I could not learn. He was relieved by adrenalin.

25 East Washington St.

OCULAR MUSCLE IMBALANCE

A METHOD OF DIAGNOSIS AND REPORT OF CASE

HARRY M. THOMETZ, M. D.,
CHICAGO

The more one studies the subject of eye muscle imbalance out of the average text-books, the more confused does he become. Apparently here is a field wherein the authors found themselves as befogged and impotent as is the average practicing oculist, and for the mere sake of rendering their texts complete, assembled from references a mess of heterogeneous data which affords the reader no basis for intelligent comprehension or for action.

I believe that I discern the rebirth of a keener interest in problems of this nature, and this paper then is appearing at an opportune time. Not to be guilty myself of the very faults that I have just condemned, bringing forth a complexity of ideas that bewilder more than they instruct, I will confine my remarks to two simple propositions. First I will illustrate and describe the method I use in detecting muscular anomalies. Second I will report on a simple case of low degree exophoria, accompanied, however, by severe symptoms and its successful management.

Referring to the photograph of a corner of my refracting room, observe, above and to the left, a so-called twentieth century test cabinet, suspended below it a phoria chart with reverse lettering, below this the refracting table with test lenses, a light and instruments for ophthalmological examination. To the right is the chair for the patient. Attached to a wall bracket in position to swing in front of the patient is a

modified phorometer, with three pairs of units. Nearest the patient are a pair of lens cells, in the middle pair of rotary prisms, each rotary combination affording a placement of one to

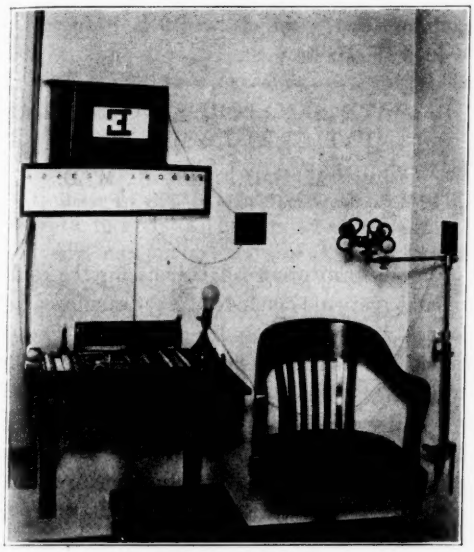

Fig. 1. Lay-out for measuring phorias.

thirty degrees of prism with axis in any meridian desired, in front a pair of fixed three degree vertical displacing prisms, the one swinging into position before the left eye with its base down, and the other swings before the right eye with its base up. Two adjusting screws are also provided, one for leveling the instrument, the other for regulating the pupillary distance.

Directions for use of the apparatus are as follows: First determine the patient's manifest correction and place in the lens cells. Then swing the three diopter prism base down before the left eye. This displaces the image seen by this eye upward, and usually causes diplopia. It may not, however, due to a well developed fusion function on the part of the patient. In such case also swing the three diopter prism base up in front of the right eye under which strength of vertical prism further maintenance of fusion will be impossible.

When vertical diplopia has been established, the upper image as stated belongs to the left eye, the lower to the right. Ask the patient if the upper crossed figure or target on the chart appears directly over the lower target. If to one side, which side? If the two targets are in exact vertical alignment, orthophoria is indicated. An upper target to the right indicates exophoria, to the left esophoria.

It is unfortunate that in the photographic reproduction incorporated in this article, the central crossed figure and the vertical line through it on the phoria chart, are faded almost to a condition of invisibility.

The spacing between adjacent numbers or letters of the scale on the chart in all instances is equivalent to a prismatic displacement of one diopter. The actual distance of these spaces on the chart that I use is 2.1 inches. This figure is simply arrived at from the consideration that in my office the distance between the chart and the patient's eyes as seen through a mirror measures 17.5 feet or 210 inches. A one diopter prism is a prism of such strength as will displace the image of an object seen, through one hundredth of the distance to which the object is removed. The correlation of the factors, 2.1 inches of spacing on the scale of the chart, and 210 inches distance of the chart from the patient's eyes hence is obvious.

Proceeding, tell the patient to observe the long line or stem extending vertically through the center of each target. In exophoria the long line or stem of the upper target will point downward toward one of the numbers in the scale of the lower chart. Ask the patient, to which number in the lower scale, this upper stem points at the nearest. If, for instance, it points at 2, we immediately have a reading of two diopters of exophoria. In esophoria, ask the patient to which letter in the lower scale, the upper stem points the nearest. Assume, for example, that the stem points halfway between A and B, and we have a reading of 1.5 diopters of esophoria.

The case that I have to report is that of Mr. D. W., age 46, who first appeared in my office on June 9, 1930. The patient requested a fitting with a new pair of glasses, having lost his old ones after wearing them without change for nine years.

The following corrections were accepted by the patient:

Manifest:

Right eye, +50 sphere +25 cylinder axis 90, Vision 20/20.

Left eye, +75 sphere, Vision 20/15.

Homatrophine:

Right eye +1.25 sphere +25 cylinder axis 90, Vision 20/20.

Left eye +1.50 sphere, Vision 20/15.

Post cycloplegic.

The full homatropine correction caused but slight blurring at a distance, and in as far as the patient was adverse to the use of bifocals, it was so prescribed with the idea of its serving the requirements both of distant and of near vision. An exophoria of 2.5 diopters was present, and at this time was considered so trivial as to require no special management.

The patient returned on June 23, 1930, with a complaint of severe pains which located themselves in back of the eyeballs and in the forward part of the temples. Nearly always they would come on during a trip in a street car or an automobile, and often thereafter they would last through and keep the patient awake most of the night. Judging from his haggard appearance, the account of suffering endured was probably not exaggerated.

The power of the lenses were now each reduced one-quarter of a diopter, with the idea that the forcing of accommodative effort with weaker lenses would increase the associated power of convergence and counteract the exophoria. This is orthodox teaching and procedure. The patient gave these lenses a thorough trial, but with a continuation of symptoms until November 5, 1930.

Starting on this date, I subjected the patient to daily base out prism exercises, using the Wrisley prisms of the phorometer, and continuing steadily for two weeks. At the conclusion of each exercise period, a phoria test indicated about one diopter of esophoria, in other words, a slight over correction of the imbalance. However the effect would not and could not be made to last, as on each succeeding day, before resuming a seance, a test would show the same 2.5 diopters of exophoria. At the end of two weeks in the office, the patient was advised to continue at home fifteen to twenty minute daily practice at exercising his convergence on a pencil point, which at the end of another two weeks he claimed he had faithfully done. But the imbalance still persisted and also the ocular discomfort.

I was now convinced that the text-book idea of overcoming an exophoria by building up an increased power and tonus in the convergence muscles through any sort of exercise was something extremely difficult to realize. And although another text-book tradition is that it is not wise in cases of outward imbalance to give base in prisms for constant wear, as such prisms favor and tend to increase the deviation, nevertheless on January 5, 1931, I furnished this patient with new lenses of the same sphere and cylinder correction, with the additional incorporation in each of a one diopter base in prism. The patient returned to the office two weeks later, radiating smiles and satisfaction, and reporting complete relief of symptoms, automobile and street car trips notwithstanding.

On March 6, 1931, the patient again presented himself to report a continued complete absence of all ocular discomfort. Moreover, a phoria test with glasses on, now revealed the existence of one diopter of exophoria only, so that the cure is in process of becoming functional as well as being symptomatic.

4010 W. Madison St.

PRIVATE SANATORIA FOR MENTAL PATIENTS IN ILLINOIS

JOHN M. GRIMES, Ph. B., M. D.
Director, Sanatoria Study, Illinois Society for Mental Hygiene
CHICAGO

Private institutions in Illinois for the care of mental patients include: (a) sanatoria, (b) homes, and (c) schools for defectives. This discussion is concerned primarily with the sanatoria.

Until quite recently, no line of distinction has been drawn between a sanatorium and a home. Indeed no one seems ever to have collected sufficient data to make such a differentiation possible. This unfortunate situation has been ended by the Illinois Society for Mental Hygiene, whose representative recently made a personal visit* to every private institution known to house mental patients or defectives within the state. As a result of this inspection tour, the differences between sanatoria and homes have been made clear and a basis of classification arrived at.

1. Briefly stated, a sanatorium is housed in a building usually erected for sanatorium purposes and offering room for (a) social intercourse (parlors, sun porches), (b) recreational activities (games, gymnasium) and (c) treatment (hydrotherapy, occupational therapy), in addition to its facilities for eating and sleeping; a home, on the other hand, is almost invariably housed in a building originally constructed for residential purposes and offering little or nothing in addition to living quarters.

2. Moreover, a sanatorium contains a reasonable amount of equipment for (a) medical diagnosis, (b) protection of its patients against accidents, (c) emergency relief measures, and (d) therapeutic procedures; a home is deficient in some or all of these points.

3. Again, (a) a sanatorium either has a resi-

*These inspections were made during February, March and April (1930), and this discussion of sanatoria is based on the inspection report.

dent physician (i. e., present in the building day and night) or has one or two physicians who call one or more times daily and are definitely responsible for all patients; (b) it has for its head nurse one who has graduated from a general hospital or has had special training in a state hospital, or both; (c) it has a nursing staff of at least one nurse for every three patients; in a home, the medical and nursing supervision is of a lower order.

4. Finally, in a sanatorium, the number of mental patients, what has happened and is happening to them, and their progress toward recovery, are more or less matters of record, which may be investigated and reported on; in a home, these things are largely matters of memory, and may or may not be inquired into according to the will of the person in charge.

When classified in relation to the items mentioned above, only eleven of the private institutions for mental patients in Illinois may be called sanatoria. There are six others whose names include the word "sanitarium," but these, together with nine that are known by other names—fifteen in all—are lacking in too many important respects to be given a higher classification than that of homes. In the accompanying table, in which the personnel and equipment of sanatoria and homes are compared, these deficiencies will be easily recognized. No odium attaches to the classification made here; in many of these homes it is frankly admitted that only home care is attempted; the only requisite is that their classification be understood, so that the medical profession and the general public will not expect of these homes a service they are not prepared to give. In defense of these homes it may be said that they usually charge an appreciably lower rate than do sanatoria.

In the eleven sanatoria of the state, the *buildings and grounds* are for the most part satisfactory. Six of the eleven are delightful places to live in. The buildings and their furnishings are clean and comfortable, and give evidence of a real interest in the patient's reaction to environment.

The *equipment* in seven of these sanatoria may be called complete; i. e., seven are reasonably well equipped for 1. diagnostic, 2. protectional, 3. emergency and 4. therapeutic care, while four are lacking in one or more of these four particulars. But this lack is usually made up to some degree in some other way. As a conspicuous example of such compensation one of the "down state" institutions may be cited; it has no occupational therapy department, but it has a remarkable department of hydrotherapy and a hundred acres of wooded hills and farm land, including two golf courses. By means of baths, massage, games, long walks and some farm work, the patients are kept busy without occupational therapy.

The *personnel* in six of the eleven sanatoria includes a resident physician. At four of the other five, two physicians make daily visits, while at the one remaining one physician calls daily. In ten of the eleven the head nurse is a graduate of a general hospital, and in the one remaining the head nurse has had a long period of training in state institutions. In ten of these sanatoria the ratio of nurses to patients is as high as (or higher than) one to three; in the one remaining this ratio probably obtains among the mental patients, though not so high among rheumatics and others under treatment for physical ills only; in one of the sanatoria there are more nurses than patients.

Among the *patients* of all these sanatoria there is evident an effort to safeguard social relationships and yet encourage normal social contacts. There is preparation, on the part of these institutions, to protect, and even to entertain, as well as treat the patients. The human element is given even more attention than is usual in general hospitals. Records in a few of them are remarkably full and complete; in a few others they might easily be improved..

Aside from the eleven institutions above discussed, Illinois has three or more private sanatoria that operate in the field of general medicine and state that mental patients are not wanted, but into which mental patients are sometimes received. These institutions are splendidly equipped and conducted—but not for mental patients. They are not prepared to protect mental patients against the accidents more or less peculiar to their ills, nor can they meet the emergencies that arise. Consequently, a considerable number of these patients must sooner or later be removed post-haste to the institution offering such facilities. Such a procedure is both expensive and dangerous, but it is the natural outgrowth of a prejudice that will yet require years to overcome, and it is fostered by the institution's

inclination both to accommodate and to make money. The solution to this problem is not clear.

There are yet a few other sanatoria, also operating in the field of general medicine, not prepared to give mental patients proper care but openly welcoming or even soliciting such patients. These are institutions that are deficient in one or more vital points, and they drag in a few mental patients because their legitimate field of general medicine fails to yield them patients enough to satisfy them financially. For the patients, this is a misfortune; for the institutions, it is not so because they have no reputation to defend. Therefore such misfortune can probably be avoided or ended only by legal interference.

There are a few homes for mental patients that aspire to be classed as sanatoria. Such an aspiration is quite laudable—if it leads to the making of such improvements as will enable the institution to give its patients the care that the eleven sanatoria of the state now give. Of the fifteen homes now offering care for mental patients, not one has an occupational therapy department, and only two have continuous-flow tubs (which in a home for mental patients may be taken as the initial step in the building of a department of hydrotherapy). Eight of the fifteen are in charge of practical nurses—a term that can mean most anything or nothing at all. Nine are located in Chicago, in houses built for residential purposes. Most of them are reasonably well kept. The patients are roomed, boarded, and protected against accident. Physicians call at varying intervals. Sometimes the patients are taken out for walks. What else happens to them is open to question. Little or no records are kept, and an investigation would reveal only what the persons in charge were inclined to disclose.

Considered as homes, these places may be reasonably satisfactory. Many of their patients are seniles, and these pitiable left-overs from the life of yesterday probably receive more kind consideration in some of these houses than could possibly be accorded them in the small but bustling quarters of the city apartments of their relatives. But a mental patient whom therapeutic measures might restore to normal mental life is out of place in such a home unless available finances are insufficient to provide treatment in a sanatorium. Such a home can itself become a sanatorium in only one way: by providing such buildings, such equipment, and such personnel as will enable it to give its patients proper therapeutic as well as custodial care. The eleven sanatoria of the state are doing that, and some are doing it remarkably well. A list of these sanatoria is given below.

SANATORIA IN ILLINOIS

No.	Name and Address	Class	Capacity	Patients	Nurses	Rates	Person in Charge
Aurora							
1.	Mercyville Sanitarium	S	175	150	50	30-50	Sr. M. Cornelia
Batavia							
2.	Bellevue Pl. Sanitarium	S	35	35	13	35-50	Dr. Amelia Zimmerman
Chicago							
3.	Chicago Sanitarium, 2828 Prairie Ave.	S	135	40	20	30-100	Dr. A. B. Magnus
4.	Goodheart Sanatorium, 3358 S. Mich. Av.	S	20	16	13	30-50	Mrs. Ella Hart
5.	Parkway Sanitarium, 2622 Prairie Ave.	S	40	30	11	25-100	Dr. B. J. Sherman
Elgin							
6.	Resthaven Sanitarium, 600 Villa St.	S	75	57	16	30-45	Miss Libbie Goll
Jacksonville							
7.	Norbury Sanitarium, 1631 Mound Av.	S	125	110	50	35-50	Dr. A. H. Dollear
Kenilworth							
8.	Kenilworth Sanitarium	S	30	25	28	55 up (40 for nurse)	Dr. J. M. Robbins
Peoria							
9.	Michell Farm	S	20	18	6	46-51	Dr. George W. Michell
10.	Peoria Sanitorium, 106 N. Glen Oak Ave.	S	24	17	6	51	Dr. George W. Michell
Rockford							
11.	Wilgus Sanitarium	S	35	30	12	45	Dr. Egbert W. Fell
Totals			714	528	225		

No.	Class	Res. Phys.	H. Nurse a Grad.	Diag. Lab.	Con. Fl. Tub	Occup. Ther. Dept.
1.	S	No	Yes	Yes	Yes	Yes
2.	S	Yes	Yes	No	No	Yes
3.	S	Yes	Yes	Yes	Yes	Yes
4.	S	No	Yes	No	Yes	Yes
5.	S	Yes	Yes	Yes	Yes	Yes
6.	S	No	Yes	No	Yes	No
7.	S	Yes	Yes	Yes	Yes	Yes
8.	S	Yes	Yes	Yes	Yes	Yes
9.	S	No	Yes	Yes	Yes	No
10.	S	No	No	Yes	Yes	No
11.	S	Yes	Yes	Yes	Yes	No
12.	H	No	No	No	No	No
13.	H	No	No	No	No	No
14.	H	No	Yes	No	No	No
15.	H	Yes	No	No	Yes	No
16.	H	Yes	Yes	No	Yes	No
17.	H	Yes	No	No	No	No
18.	H	No	Yes	No	No	No
19.	H	No	Yes	No	No	No
20.	H	No	No	No	No	No
21.	H	No	Yes	No	No	No
22.	H	No	No	No	No	No
23.	H	Yes	Yes	No	No	No
24.	H	No	Yes	No	No	No
25.	H	No	No	No	No	No
26.	H	No	No	No	No	No

SUMMARY AND COMPARISON

	Total Cap.	Total No. Patients	Total No. Nurses	Av. Cap.	Av. No. Patients	Av. No. Nurses
Sanatoria ...	714	528	225	66	57	20
Homes	219	163	52	14	11	4

	No. Res. Phys.	No. Grad. H. Nurse	No. Diag. Lab.	Con. Fl. Tub	Occup. Ther. Dept.
Sanatoria	6	10	8	10	7
Homes	4	7	0	2	0

The average rates in a sanatorium are $37.50 per week. The average rates in a home are $22.50 per week.

At a sanatorium that has no resident physician, there are either one or two physicians who visit the sanatorium daily and are on call at other hours. At a home, daily visits are not usually made by any physician.

EFFECT OF INTRAPARTUM CARE ON THE MOTHER*

J. P. GREENHILL, B. S., M. D., F. A. C. S.
CHICAGO

The maternal death rate in the United States is not definitely known, but it is not an exaggeration to say that at least 20,000 women die every year as the direct or indirect result of childbirth. Of this number, approximately 8,000 die from puerperal infection, 5,000 die as the result of eclampsia, 4,000 succumb to excessive loss of blood, and about 3,000 lose their lives from other causes associated with child-bearing. The number of women who are severely but not fatally injured during labor cannot be estimated, but it is undoubtedly enormous. The common belief is that between 50 and 60 per cent. of all the gynecological operations performed are necessitated by damage which occurs at the time of confinement.

This paper deals with the effect of intrapartum care on the mother. It is a well-established fact that the proper conduct of labor will considerably reduce both the maternal mortality and morbidity. We have proof of this all over the world, but I should like to analyze briefly the results obtained at the Chicago Lying-in Hospital. In this institution, during a period of nine years, there were 23,136 deliveries. The hospital is an "open" one and in addition to the regular staff, approximately 50 outside physicians deliver women in it. Practically all of these doctors are careful and conscientious, and they willingly conform to the prescribed technic. For obvious reasons the incidence of operative deliveries in this hospital is much higher than it is for general obstetric practice, hence there is occasion for increased maternal mortality and morbidity.

Among the 23,136 women there were 57 deaths, giving a total maternal death rate of 0.246 per cent., or 24.6 deaths per 10,000 births. For the entire registration area in the United States the incidence was 68 per 10,000 live births in 1921, 66 in 1924[1] and 65 in 1927[2]. The death rate in our country in 1924 varied from 45 per 10,000 living births in Utah to 121 in Florida[2]. In England and Wales for the year 1926 the maternal death rate was 51.4 per 10,000[3], in Canada for the year 1926, it was 60[4], and in the city of Amsterdam for 1928 it was 64[5].

According to Woodbury[1], two fifths of all the maternal deaths in the registration area of the United States are due to septicemia. Hence, the most important single cause of these deaths is puerperal infection, which is the result of lack of surgical cleanliness. By means of careful asepsis, almost all of these deaths can be prevented. Nicoll[2] analyzed 696 maternal deaths which occurred in New York state by studying

*Read before the Child Hygiene Section of the American Public Health Association, October 2, 1929.

the death certificates and personal replies to questionnaires sent to the doctors who reported the deaths. The death certificates showed that 37 per cent of the deaths were due to puerperal sepsis, 21 per cent. to toxemia, and 9 per cent. to hemorrhage, but these figures are too low as indicated by the answers to the questionnaires. Furthermore, the death certificates showed that only 5 per cent. of the cases were operative, whereas the questionnaires revealed that 38 per cent of the cases had been operative.

The causes of death at the Chicago Lying-in Hospital were as follows:

	No.	Percentage
Pneumonia (chiefly after general anesthesia)	14	24.6
Toxemia	10	17.5
Heart disease	9	15.8
Abruptio placentae	6	10.5
Embolism	5	8.8
Peritonitis (one from gonorrhea)	4	7.0
Septicemia	3	5.3
Rupture of uterus	3	5.3
Hemorrhage from placenta previa	1	1.8
Shock	1	1.8
Enlarged Thymus	1	1.8
	57	100.2

There were three deaths from septicemia but only one of these resulted from an infection which developed in the hospital.

The morbidity at the Chicago Lying-in Hospital has likewise been exceptionally low. The standard accepted is the most rigid reported, namely, every elevation of temperature up to 100° F.. or above even if recorded only once from the moment of delivery until the patient is discharged from the hospital. Under this strict standard, the total morbidity among the 23,136 patients was 10.8 per cent. The morbidity standard of the British Medical Association reads as follows: "Puerperal morbidity should include all fatal cases and also all cases in which the temperature exceeds 100° F. on any two of the bi-daily readings from the end of the first to the eighth day after delivery." If we follow this standard the incidence of morbidity at the Chicago Lying-in Hospital was only 4.3 per cent., which is indeed very low. It is needless to emphasize that a fair proportion of this morbidity was due to extragenital causes.

The intrapartum care given the patients at the Chicago Lying-in Hospital is essentially the same as is given in any large teaching or special maternity hospital, and I shall attempt to outline the features of this type of management.

Each of the three stages of labor requires special consideration. In the first stage, it is generally agreed that the best results are obtained when a policy of watchful expectancy is followed. However, this should not be interpreted to mean that everything should be left to nature else many patients would be definitely neglected. It is assumed that long before a patient goes into labor, she has had a complete physical examination and her condition is refreshed in the mind of the physician by a re-reading of his prenatal notes. Most women who are in the throes of active labor have no inclination to drink or eat, but they should be encouraged and even made to drink a large amount of water. They should also be given a moderate amount of solid and semi-solid food, especially carbohydrates. In cases of prolonged labor, if a large amount of carbohydrate food cannot be eaten by the patient it is best to give glucose subcutaneously or intravenously, especially before an operative delivery. In cases where there has been great loss of blood as in placenta previa, blood transfusion is indicated. The bowels should be evacuated at least once every twelve hours or an enema given, unless the child is soon to be born. An enema at such a time is inadvisable because the liquid feces may be expelled during the delivery of the baby and the field will be contaminated. The bladder should frequently be emptied preferably by spontaneous action, else by catheter. Many women in labor do not think of emptying their bladder or prefer not to make the effort, hence the bladder must be watched carefully. A full bladder or rectum occasionally interferes with the normal mechanism of labor.

Sedatives such as morphine with the addition of atropine, magnesium sulphate or scopolamin should be given hypodermically in the first stage not only to relieve pain but also to preserve the patient's physical strength and her mental attitude. The psyche is a very important factor, especially in long, hard labors. It may not be amiss to add parenthetically, that since the morale of the patient's husband influences the patient considerably, it is important to say a few words of encouragement from time to time to the

husband and make certain he obtains some rest as well as the patient.

In the vast majority of cases, the entire first stage can be conducted by means of abdominal and rectal examinations, but a vaginal examination should be made when there is any doubt. The physician should constantly be on the alert for complications such as threatened rupture of the uterus, abruptio placentae, eclampsia, and cardiac collapse. It is important that an occipito-posterior position be recognized early, for this position is a frequent one, and if it persists and is unrecognized, it may cause much grief.

Cases of definite cephalo-pelvic disproportion must be detected early and cesarean section performed. It is gross negligence to overlook such a condition until a patient has been in labor so long that a cesarean section is a dangerous procedure for the mother. However, the low cervical cesarean section, which is by far the safest type of cesarean section, may be performed even after labor has been in progress a relatively long time.

Attention should be paid to the asepsis and antisepsis of the patient's surroundings. In making rectal examinations sterilized gloves should be used and special care should be taken to avoid inserting the thumb into the vaginal introitus. Special preparations are of course necessary when vaginal manipulations are contemplated. People with respiratory infections, boils or other infections, should be kept away from the patients in labor and labor rooms, and this applies even if the husband is involved. It is taken for granted that if the doctor has an infection he will not conduct a labor case. The physician himself and his assistants, be they doctors or nurses, should scrupulously avoid contact with infectious cases and pus cases, and should not visit pathological and bacteriological laboratories while in attendance upon a patient in labor.

After the cervix is completely effaced and dilated, that is when the second stage has begun, the physician should not leave the patient. Sedative drugs should not be given at this time nor should they be given for an hour or two before the second stage has begun, because occasionally they have a detrimental effect on the child. After complete dilatation, an inhalation anesthetic such as ethylene or nitrous oxide may be given. In most cases, however, the hypodermics administered during the first stage make an anesthetic unnecessary until shortly before actual delivery takes place. Wherever possible, local anesthesia should be used instead of an inhalation anesthetic, for the risk is decidedly less to both mother and baby. In patients with toxemia and pulmonary tuberculosis general anesthesia is contraindicated. In toxemic patients the anesthetic adds to the intoxication already present and distinctly increases the risk of pneumonia.

Scrupulous care should be paid to asepsis and antisepsis just as for any major operation. Every person in the delivery room should wear a white uniform, or gown, a cap and a mask. It is very important that the mask should cover not only the mouth but also the nose. Mercurochrome liberally used outside, and in operative cases inside the vagina, helps perhaps to reduce the morbidity. In delivering the child, the head should be permitted to escape very slowly and in extreme flexion. The latter maneuver brings the smallest fetal diameters to the outlet and diminishes the frequency of perineal lacerations. An episiotomy should be performed when the perineum does not stretch readily or if there is any danger to the fetus in the prolongation of labor. The episiotomy may easily be performed under direct infiltration anesthesia.

The fetal heart tones should carefully be controlled not only in the first stage but also in the second. During actual delivery, be it spontaneous or by means of forceps, the De Lee-Hillis head stethoscope is very useful. Irregularity in the fetal heart tones may indicate distress not only in the child but occasionally danger to the mother, as for example in premature separation of the placenta. Operative interference should not be undertaken before there is complete effacement and dilatation of the cervix without a very urgent reason, because the consequences may be serious. In case of heart disease, pulmonary tuberculosis, toxemia, Graves' disease and other such afflictions, delivery should be accomplished as soon after complete dilatation of the cervix as is consistent with the safety of the mother. A forceps delivery may occasionally be avoided by a properly performed Kristeller expression. Local anesthesia should be used in these cases whenever feasible.

Pituitrin, unless used to induce labor, should never be used before the baby is born. Too many

evil results have been observed even after the administration of very small doses.

The proper conduct of the third stage of labor is of the greatest importance because according to De Lee[6] "more women die from accidents of the third stage of labor than during the other two combined." Strict conservatism should be the rule in this stage unless hemorrhage forces activity. If manual removal of the placenta becomes necessary it is safest to change gloves and liberally use mercurochrome in the vagina. The routine use of pituitrin after the baby is born and of ergotamin tartrate after the placenta is delivered will prevent excessive loss of blood in many cases. If hemmorrhage cannot readily be controlled by drugs and massage, uterine tamponade should be resorted to without delay. It is not good policy to wait until the patient is exsanguinated before doing this, but asepsis must be as perfect as possible, even though haste is imperative. Women who lose a great deal of blood during labor, make slow recoveries, they frequently become infected, they do not nurse their babies well and they may not regain their health for a long time.

All danger is not over when the third stage has been completed. Hence it is advisable to have some one watch the patient closely for at least one hour after delivery. Patients who have had a general anesthetic must be closely guarded for many hours.

The foregoing brief outline indicates the care given the patient during labor at the Chicago Lying-in Hospital. We firmly believe that if all women in labor received such supervision and treatment, the maternal mortality and morbidity would be considerably reduced.

BIBLIOGRAPHY

1. Woodbury, R. M.: United States Department of Labor, Children's Bureau. Publication No. 158, 1926.

2. Nicoll, M.: Maternal Mortality, New York State J. Med., xxix, 800, July, 1929.

3. Young, J.: Maternal Mortality from Puerperal Sepsis; Analysis of Factors of Contagion, Trauma and Autoinfection, Brit. M. J., I, 967, June, 1928.

4. MacMurchy, J.: Maternal Mortality in Canada, Canadian M. A. J., xvii, 1424, Dec., 1927.

5. Netherlands letter in J. A. M. A., xciii, 785, Sept. 7, 1929.

6. De Lee, J. B.: Principles and Practice of Obstetrics, 5th Edition, W. B. Saunders Co., p. 333, 1928.

185 N. Wabash Ave.

PULMONARY TUBERCULOSIS AND THE CONSTITUTIONAL ANOMALIES

JOHN RITTER, M. D.

Professor Emeritus of Medicine, Department of Tuberculosis, Rush Medical College of the University of Chicago.

MIAMI, FLA.

One of the most interesting observations, a most fascinating study, is that which is observed in the fertilized ovum of the human being, the intimate union of the male and female reproductive cells. All the characteristics and the potentialities of the species are determined almost immediately at the time of this union and not only the kind and that which belong to the sex conditions, but all that which applies to the individual familial group, the character, personality, intelligence, habits, temperamental endowment, idiosyncrasies, etc., are all embodied here as latent forms or as latent factors and may be designated as the individual's constitution or the genotype. These many traits are usually conveyed to the embryo intrauterinely, that is, before birth, and are then spoken of as the normally inherited personalities. However, familial abnormalties, parental or congenital, that is, before birth, may also be transferred to the progeny, to the offspring from disharmonious parents, from a dyscrasia existing in either parent or in both parents or perhaps from a familial malformation of the ovum, etc. Generally speaking, however, what we observe as characteristic abnormal signs in an individual is usually an acquired abnormality, extrauterinely, the result of a gradual interference with the constitutional tendency or habits of the body, like nutritional disturbances, the underfed and the undernourished, the faulty surroundings or environments, the result of exposure to the extremes of heat or cold, trauma or injuries, sickness or disease, climatic conditions, functional demands of the body, etc. These may all be grouped as the result of the individual's bodily surroundings and may be designated as tissue or organ disturbances or abnormalities or better as, "constitutional anomalies."

What is the important relationship between the individual's constitution as a whole and the inheritance factor to tuberculosis? Tuberculosis pictures itself as the antagonism between the tubercle bacillus on the one hand and the immunizing possibilities of the organism on the other. If the primary infection, in infant life,

has passed off very mildly or led, either very slowly or very rapidly to a fatal disease, this was not dependent alone on the quantity and the virulence of the entering bacilli but undoubtedly also upon the resistance offered by the organism at the time of implantation and then again when later, in adult life, the process assumes the malignant type, the exudative form of the disease or perhaps pursues the mild, more benign, the proliferative, fibrous or indurated form; this also is not determined alone by the number of bacilli or their virulence but chiefly by the degree and the amount of resistance offered by the infected individual; this all is again dependent either upon the degree of immunity acquired following the primary infection or upon the amount of inherent reserve force which the body usually offers against any or all infections; hence, various constitutional factors are necessary for health such as free cellular functioning, an active lymph flow, a good circulating and an unhampered blood supply upon all these activities, the resistance of the body against the inroads of the disease producing bacteria, the tubercle bacillus, is dependent and if in this resistance against the tubercle bacillus these constitutional factors are lowered, lessening the resistance, then we speak of a constitutional disposition, tendency or anlage to tuberculous disease existing in the individual. It is now generally accepted as an established fact that there must exist in the human, in every person a general disposition or tendency to become tuberculously infected and later perhaps tuberculously diseased as well. The difference in the course pursued after the implantation of the tubercle bacillus, is, as stated above, due chiefly to the virulence of the bacteria, to the number of bacteria entering the human body and to the receptivity of the host and that following the implantation relatively only a very small proportion, about 10 per cent., of those who have become infected actively develop the disease or become tuberculous. Close observation has taught us that there must be in the human varying degrees or an individual tendency to the disease and as the implantation of the tubercle bacillus may be followed in the one by either active disease, or in the other, by no body disturbance, whatsoever, we must conclude that the different course of the same disease pursued in different individuals must be dependent upon positive constitutional factors. This all brings us back to the question of the relationship existing between the individual's constitution and tuberculous disease, to differentiate between the important points of infection and the subsequent course of the disease, the constitutional factors, chiefly, degenerative changes in various organs and tissues existing in the individual. In defining our understanding of a constitutional factor it would be of advantage if by means of abnormal signs the constitution could be stigmatized, if it were possible to describe the abnormal factors by noticeable degenerative stigmas in the individual. In tuberculosis this would be of the greatest importance because in this disease so many degenerative stigmata are demonstrable. These various signs of degenerative changes described in connection with tuberculosis are usually minor abnormalities, the result of a disturbed or interrupted development. These disturbances are usually noticeable in an abnormal growth of the hair, the teeth, glands, internal or external organs or in the body as a whole. All these various signs of degenerative changes or constitutional anomalies in the human body may for convenience be grouped as belonging to one of three varieties: (a) Either as an osteal disturbance in the bony framework of the body, chiefly the thorax, or (b) as abnormalities observed over the various surfaces of the external body and (c) as abnormal conditions demonstrable on some of the internal organs.

First—The Osteal Group—The Bony Framework. (*a*) *The Phthisical Chest.* In the osteal group must first be placed those which are observed as abnormal signs on the contour of the chest and the deformity known as the Habitus Phthisicus was very early recognized and even at length described in the writings of the ancients, who, at that early time had noticed the fact that this condition predisposes to early tuberculosis. In this we find the long, narrow, flat chest described as phthisical. We find in this form of chest development a close relationship to heredity, the chest deformity which gives evidence of a previous tuberculous process, a tuberculous process having preceded or accompanied this type of chest development. It gives, however, no absolute proof of any connection between the phthisical chest and tuberculosis because it is very well known that tuberculosis is very fre-

quently found in individuals with a perfectly normal chest development. The phthisical chest usually embraces, more or less, all the stigmata of the other chest anomalies like the stenotic and infantile type with the addition of loss of fat, muscle degeneration, emaciation, cachexia, etc.

(*b*) *Abnormalities peculiar to the bony framework other than the phthisical chest.* 1. The anatomical relationship between the morphological anomalies in the body and the development of pulmonary tuberculosis, may be divided into two groups according as the morphologic factor supplies either the disposition to the disease or is the result of an infection. The anatomical predisposition is only one of the many factors in the totality of this predisposition. The tuberculous groups may be arranged accordingly into: (a) Large trunks, the long types with small abdomen, the microsplanchnic, the typical "Habitus Phthisicus" and (b) short trunks, the brachy type with large abdomen, the megalosphlanchnic, "Habitus Apoplecticus." The basis for such grouping is dependent upon the observation that, if among the many causes of a predisposition one may be found in which the habitus plays the leading role then this special habitus must be more frequently found in the tuberculous than amongst the non-tuberculous subjects. The statistical observation and anthropometric examination included 278 individuals—208 men and 70 women at the Umberto Sanatorium in Rome. Only longitype and brachy type individuals were considered and it was observed that the long types were on an average twice as frequent amongst the tuberculous as amongst the healthy and that the short types offered only a very small percentage. This proved that the habitus phthisicus greatly favors the morphological tendency of the organism to a phthisical predisposition. The conclusion from further observation was that as a rule in the long type the beginning of the disease is more severe, the extension of the disease more stormy, the periods of remission shorter, that very frequently a reactivation of the process with a rapid and extensive invasion is noticeable, whereas in the short or brachy type, the beginning of the disease is insidious, progresses very slowly, the course of the disease is more favorable with long intervals of quiescence favoring more or less a healing tendency.

2. The contracted upper aperture of the chest, the smallness of the first rib and the first ring as first pointed out by Hart and which may subsequently favor an apical tuberculosis, is frequently spoken of as an anomaly. It is not so much the contracted upper chest area, but rather the course followed by the apical bronchus, the bronchus apicalis posterior; this bronchus frequently runs parallel to the trachea. It brings about in this area a difficulty in the air excursion during breathing. It is well known that the apical excursion as a whole is somewhat faulty, this then lessens the free blood and lymph flow to the apical region, this favors blood stasis and a more ready deposition of the tubercle bacillus as well as other foreign bodies. It is also evident that this may manifest itself more readily the greater and longer the apical bronchus is and the longer the distance from the apices to the hilum. This has been especially observed in the asthenic where there is relatively a perceptible longer distance between the apex and the hilum and Birch-Hirschfeld has early pointed out that the topography of the apical bronchus as a physical cause, a faulty respiratory functioning of the contiguous portion of the right lung, greatly favors the deposition of the entering bacilli.

3. Zilinski, on a great number of autopsies on tuberculous bodies, found many bony anomalies to which he attributes the cause of tuberculous disease. Most were signs of inherited changes, of body disturbances or development. He mentions the following abnormalities found on tuberculous cadavers. On the skull deep depressions along the lamdoidal sutures, concavity of the small fontanel, frequent Wormian bones, ossiculae Wormiana, abnormal length of the transverse processes of the lower thoracic or upper lumbar vertebrae, projection of the spinous processes of the first thoracic vertebra, simulating a prominence or spondylitis, thickening of the end of the ribs, a rickety rosary, frequent doubling of the sixth or seventh rib usually on the left side, bifurcation or fenestration of the xyphoid process, a tenth floating rib, the Stiller phenomenon, and a lack of ossification of the epiphysis, particularly of the lower extremities. The long hands observed in some tuberculous individuals is considered by many phthisiotherapeutists a sign of degenerative changes, and Polanski's observations are also interesting. He

found in ninety-four tuberculous men and forty-five women, a total of one hundred and thirty-nine, a flat chest in fifty-eight, biacanthia in forty-nine, very long hands in twenty-six and long heads in twenty-four. In ninety non-tuberculous male and female, biacanthia in eighteen, long heads in fourteen and long hands in eight. He also frequently found perforation of the xyphoid cartilage, tenth floating rib, promontoria of the lower spine, etc.

To this skeletal group may be added such other bony anomalies mentioned by clinicians as being perhaps related to tuberculous disease. The cervical ribs frequently found in scrawny individuals, a sixth lumbar or sacral vertebra most often a sacral, a contracted fifth finger or unusually long fingers, the disproportional development in the length of the upper or the lower extremities and perhaps structural anomalies occasionally observed in the teeth, disproportional numbers, faulty eruptions, etc.

The abnormalities of the scapulae should also be mentioned here. The vertical border of the scapula, in the normal is slightly convex, yet in adult life this border may assume any shape, convex, concave, scaphoid, straight, convex-sigmoid, wave-like, etc. This edge, which in adult life is subject to various changes in contour, is supposed to be brought about by the rhomboideus major muscle. However, may it not be considered a constitutional anomaly and if so, is it found more frequently in the tuberculous than in non-tuberculous individuals?

Other degenerative changes or bony abnormalities usually noted by clinicians may be mentioned here—scoliosis and kyphosis, perhaps gibbus, drooping of the shoulder on the involved side, conspicuous and prominent Ludvig's angle, anomalies of the clavicle referred to as the clavicular phenomenon, visible bony retraction and immobilization of the involved area, the epigastric or subcostal bony angle, trophic changes about the finger nails and clubbing of the fingers, high vault of the roof of the mouth, etc., may all belong to this category.

Second—The abnormalities observed on internal organs (not osteal) which may point to tuberculous disease. Signs of degenerative changes of some of the internal organs. The utilization of this fact in comparing it to various diseases was first described by Rokitansky in 1841. In his doctrine of the habitus phthisicus he defined the tendency to tuberculosis from an anatomical viewpoint. He recognized a poorly developed musculature, a small heart, a phythisical condition of the chest, viz., a small thorax, lessened depth and an excessive length and in comparison with this, the lungs are abnormally large. Benecke by comparative weighing and by measurements of the various organs of the body finds that in the tuberculous the lungs are usually large, the heart small, the intestines also small and small arterial vessels and the pulmonary artery when compared with the ascending aorta is smaller and Brehmer, a close observer, describes anatomically the long chest and the small heart in the phthisical. He calls particular attention to a lessened functioning of the small heart, the relatively small arteries and that by means of such degenerative changes a resulting lessened nourishment of the lungs, predisposition to tuberculous disease is established. Hart notes the following examples: The hypoplastic or small heart, small aorta, enteroptosis, funnel shaped or excessively long appendix, long flabby tubes, tenth floating rib, horseshoe kidney or absence of a kidney, usually the right, and Zilinski points out that analogous to the skeletal disturbances noted above and what seems to show a faulty development that many of the internal organs are similarly affected, like an absence of the middle lobe of the right lung, a hypoplastic heart, thin vessels with paper-like walls (aorta papyracea), bifurcation of the aorta as high as the second or third lumbar vertebra, liver irregularities like hepar lobatum, numerous lobes produced by deep fissures, abnormal length of the right lobe of the liver, horseshoe kidney, occasionally an absence of one kidney, usually the right, absence of a kidney pelvis in which instance numerous ureters run together; abnormally long ureters; spleen occasionally fissured and nodular, fetal position of the stomach, abnormal length of the appendix or a funnel shaped condition, patency of the inguinal canal and malformation of the colon and its appendages. All these investigators have pointed out that hypoplasia of the vascular system was a most important predisposing factor, a fact early pointed out by Virchow.

The number of degenerative changes observed in the internal organs is less than those demon-

strable on the external body and from this many observers conclude that the former are due to inherited disturbances which predispose more readily to tuberculous disease.

Third—Abnormalities noticeable on the body as a whole, usually on inspection. By far the greater number of abnormalities which may point to tuberculous disease are those found on the external integument. Rosolima observes that in individuals of the so-called phthisical constitution or in those from tuberculous families that a large percentage show anomalies of the external ear such as an irregular development of the upper lobes and Kwiatowski that in men suffering from pulmonary tuberculosis frequently a heavy head of hair with the female type of hair at the genitalia and some French authors, Fournier, Ricochon, et al., have pointed out a disharmony of the hair as a constant anomaly such as a combination of dark brown hair with a bright red moustache, this was particularly noticeable in tuberculous enteritis and as further specific signs in the tuberculous they point to the asymmetry of the face, faulty development of the upper lip, the hair on the forehead, eyebrows and eyelashes, vault of the mouth, the nasal openings, retraction of the nipples in women, illy developed navel, phimosis atresia, undescended testicle, rupture, etc. Amongst the greater number of abnormalities enumerated, the most frequent and the most pathognomic are in men, the female type of the hairy growth about the genitalia. Schmidt also points to a faulty development as a sign of a constitutional anomaly and in this category he places supernumerary nipples, naevi, meeting of the eyelashes, unilateral facial paresis and Herbert points to unilateral anomalies as usual symptoms of a diseased lung. Tuberculosis of the larynx is usually found on the involved side and the pupil is frequently found dilated on the affected side, a lessened pigmentation of the areola of the mammae on the diseased side, a disproportionment of the mamma being smaller over the diseased lung, the nipple being also smaller and acne vulgaris, if present, is always more pronounced over the involved side as well as atrophy or a lessened hair growth. Trophic changes may also be noticeable in the male nipple and also found on the side of the diseased apex and all these unilateral anomalies are due to a faulty development or degenerative changes in the respected lung involved. The cause of all these unilateral disturbances is, in all probability, due to degenerative changes in the trophic fibres of the nerves.

Polymastia and Tuberculosis. Some years ago a paper appeared in the *London Lancet* from the pen of Dr. Teizo Iwai, a physician in charge of the Japanese Red Cross Hospital at Tokai, reporting his observations on 6,274 physical examinations of the chest, both tuberculous and non-tuberculous. He reports that many individuals suffering from pulmonary or pleural disease or in many cases of only suspected disease, that a positive relationship between polymastia and tuberculosis exist. He arrived at the following deductions: That 1, when we compare the patients suffering from tuberculosis with those who do not, the cases of polymastia are found in greater number among the former and 2, those who have polymastia are more liable to be affected by tuberculosis than those who have not.

In all of the 6,274 patients examined he found 315 cases of polymastia or 5.02%. According to sex, 3,665 males he found 120 cases or 3.27% and females, 2,609, 193 cases of polymastia or 7.58%. In 1,449 tuberculous individuals he found 119 with supernumerary nipples or accessory mammary glands or 8.21% compared with 196 cases in 4,825 non-tuberculous patients or 4.06%. In the 315 cases of polymastia out of the total number examined, 6,274 patients, he found 119 in tuberculous or suspected tuberculous or 37.77%. He observed that cases of polymastia are found more among the tuberculous, especially in the pulmonary form, than among the non-tuberculous, many times as numerous, and those who have polymastia are more liable to be affected by tuberculosis than those who have not a difference of more than 15%. Dr. Squire, also in the *Lancet,* makes this statement: "Though I have not infrequently noticed supernumerary nipples in healthy persons, I do believe that the proportion of tuberculous patients showing this peculiarity (abnormality or anomaly) is greater than amongst the healthy I have examined."

From these observations it may be apparent that in individuals in whom many anomalies are observed that there exists in all probability a greater predisposition to the development of

tuberculous disease and again in all probability that the more anomalies of development exist in the body, the earlier and the more rapid after infection does active disease follow. However, we must always bear in mind that no specific sign, ever so plainly demonstrable, is in itself insufficient to point to tuberculous disease in an individual because all of these signs are found in both the tuberculous and the non-tuberculous, but these signs of degenerative changes are found more often in the former than in the latter. Polanski, in one hundred and fourteen autopsies on tuberculous cadavers, found sixty times degenerative changes in the lungs and in other organs.

CONCLUSIONS

First, there are no indisputable signs of an anomaly in any individual which point to a tuberculous disease because similar signs are very frequently found in non-tuberculous subjects.

Second, constitutional anomalies, both the acquired as well as the congenital peculiarities of a given individual or a combination of all, are dependent upon a heightened disposition.

Third, anomalies when grouped together are usually found to be very numerous. However, we must always bear in mind that individuals spoken of as disposed to tuberculous disease or those who may be so classified are in the greater number instances already tuberculously diseased.

Fourth, the close contact in childhood with the bacilli carriers may be an important factor in the etiology of tuberculous disease. However, it is not the only one and may even not be the most important. From long observation we know that in the greater number of cases of tuberculous disease an inherited constitutional disposition or tendency is necessary to bring about the disorder and then on the other hand, paradoxical as it may seem, this inherited disposition in the individual often gives the power to resist the invasion and implantation of the bacillus, and

Fifth, as anatomical changes, brought about by the presence of the tubercle bacillus in the various tissues and organs of the human body, are not transmitted to the offspring, we must assume that there must be an inherited or congenital property in the body which may favor a heightened disposition to tuberculous disease. This may be dependent upon anatomical or functional anomalies and these various disposing factors may be due to changes in the thorax, to constitutional anomalies, circulatory disturbances, different diathetic changes, changes in the body lymphatics and vagatonic conditions, etc.

LITERATURE

Kurt Eichwald, Friederichstadt Clinic for the Tuberculous, Berlin, Constitutional Anomalies and Tuberculosis. Zietschrift fur Tuberculose Forschung. Volume 34, page 17, 1921.

Julius Bauer, Vienna. Tuberculosis and Constitution. Zeitschrift für Tuberculose Forschung, Vol. 34, page 615, 1931.

Raymond Pearl. Constitutional Factors in Tuberculosis. Am. Review of Tuberculosis, page 688, 1920.

Taizo Iwai, Japan. The Relationship Between Polymastia and Tuberculosis, Lancet, London, page 958, 1907.

J. E. Squire, London. The Lancet, page 1275, 1907.

2370 S. W. 23rd Terrace.

IMPOTENCY AS SEEN BY THE UROLOGIST

C. OTIS RITCH, M. D.
Attending Urologist, Illinois Masonic Hospital
CHICAGO

Impotency as it occurs in a cross section of a urological practice probably is quite different from that encountered in general medicine or any other specialty. It is likely, too, that more instances and varieties of partial impotency are discovered in this particular branch of medicine, since the preponderance of those consulting the urologist does so with a distinctly genito-urinary complaint.

In discussing the causative factors of impotency one invariably thinks first of the word psychic. This probably is due to early medical training or associations; as a matter of fact, purely psychical impotency is rarely encountered by one who strictly limits his practice to urology. So much so, that the urologist sometimes wonders if the term psychic impotency is not greatly overplayed; and many instances of impotency are dubbed psychic when as a matter of fact they have real demonstrable pathological changes within the genito-urinary organs. This statement is made not to imply that psychic impotency is a medical curiosity or does not occur at all, (as I am told by psychiatrists that the reverse is true) but rather to stimulate a more diligent search for pathological lesions, whether they be gross or minor. One might be suffering with this complaint in which the prostate is practically normal in size but sufficiently abnormal in consistency or contour to be detected by the expert. It sometimes happens that too

much stress is placed in the microscopic picture at the expense of a careful clinical examination. One must remember that in certain types of prostatitides, few pus cells will present themselves in the expressed secretion, when a careful digital examination of the prostate and seminal vesicles will elicit inflammatory changes in one or both of these organs.

At this time, it is well to relate that due to the intimate anatomical relationship of the prostate and seminal vesicles, that one of these structures is rarely if ever involved in an inflammatory process that the other is not involved to a lesser degree, one or the other predominating, so that in reality the condition should be termed a prostato-vesiculitis so urgently stressed by the late Dr. Belfield. However, for brevity's sake, one or the other is generally designated, depending upon which predominates in the particular process.

In speaking of the expressed secretions of the prostate, it is certainly most important to remember that many cases of rather inactive chronic prostatitis is converted into an acute prostatitis with its accompanying train of annoying sequelae as, chills, fever, frequency, difficulty and dysuria, by too vigorous massage, in fact a prostatic abscess is not a rare concomitant.

The exertion of a tremendous force and pressure is certainly carried out much too often for the good of those who suffer from a prostato-vesiculitis. I seriously question the aid one derives from the examination of the secretion if the examiner is not sufficiently proficient to determine a pathological change by digital examination. One would hardly expect to find much evidence in the expressed secretions of an individual with chronic interstitial prostatitis or a peri-prostatitis. These conditions usually are associated together in what is termed a pan-inflammation of the prostate and seminal vesicles, these structures being matted together by a fibrosis.

I am placing great stress upon prostatitis, since it is the outstanding cause of impotency and because its presence not alone in impotency but even more especially in other conditions, is very often overlooked. A few colleagues in urology are even guilty of overlooking certain cases because of the sparsely scattered pus cells in the prostatic secretion.

Seminal vesiculitis is another of the great triad of causes of this syndrome; but as stated previously, is practically always associated with a prostatitis. However, in this particular the vesicles stand out as the primary or disturbing factor. These are the offending structures in that relatively large class of individuals who give no venereal history but rather one of improper sexual hygiene. Particularly is it noted that victims of impotency who still are in their twenties or early manhood suffer from a vesiculitis and quite often the atonic variety of seminal vesiculitis predominates. This type is occasionally seen in those who have had urethral strictures for a number of years.

The atonic variety is characterized by the enormous size, the readily detectable fluid content which is rather difficult to express in its entirety, and the minimum number of pus cells in the expressed secretion. This is one of the most intractable types, so far as treatment is concerned. Not infrequently two or three months are required to effect relief. In fact this time element is the rule rather than the exception. Instances requiring from three to six months for complete recovery are not rare.

Stricture of the urethra is another primary cause as encountered by the urologist, and as such it is decidedly necessary to be alert to the fact that a stricture does not have to be of filiform size, but may be of a goodly sized caliber and still cause obstructive or inflammatory changes. As an example, it is only necessary to say that many individuals with strictures calibrated in the thirties have a constant mucopurulent discharge, showing that a persistent inflammatory state evolves around and behind the strictured area; so much so that a chronic prostatitis is a constant concomitant of strictures of the urethra. As a mild chronic posterior urethritis occurs with a stricture, so does a prostatitis develop from the latter. The constant inflammation and irritability about the verumontanum results in an impotency. Often the early stages is an ejaculatory precox caused by irritability which if allowed to linger without proper attention eventually ends as a complete impotency.

A round cell infiltration or a fibrosis frequently develops from the prolonged irritation and inflammation so that a condition of fibrosis

exists in the deep urethra. This, of course, is a late development. Rarely fibrosis of the deep urethra is encountered in youths in whom it is difficult to ascribe it to an inflammatory reaction, possibly being congenital just as fibrosis and stenosis of a congenital nature is encountered in other parts of the body. These may present themselves with sexual complaints and be free of urinary complaints or physical findings other than the fibrosis.

Conclusions:

1. The trend of sexual impotence to the urologist is predominately organic in origin.
2. The psychic type apparently predominates in the psychiatrist's practice.
3. The outstanding causes are prostatitis, seminal vesiculitis, and urethral strictures.
4. Less frequently encountered are those with congenital anomalies.
5. Cases occurring in general debilitating diseases are well known.

55 East Washington Street.

POST-OPERATIVE WOUND INFECTIONS ("STITCH" ABSCESS): A SUMMARY OF POSSIBLE ETIOLOGICAL FACTORS*

GUY S. VAN ALSTYNE, M. D.,

CHICAGO

I have arranged for convenience of discussion the following classification of surgical wounds which may show post-operative infection:

1. Wounds made through obviously infected tissue, such as boils, carbuncles, "Felons" which are "pointing."
2. Wounds made through apparently healthy tissue, but opening into frankly infected regions: Appendiceal abscesses, tendon sheath infections (not "pointing"), para-nephritic abscesses thoracic empyemata, etc.
3. Wounds made through apparently healthy tissue for surgical treatment or removal of lesions which are on an infective basis, but which at the time do not show evidence of free infective material: Cholecystectomy for chronic cholecystitis, appendectomy during an interval between acute attacts, salpingectomy for chronic salpingitis.
4. Wounds made through apparently healthy tissue for the purpose of performing surgery on structures of a recognized non-infective nature: Herniorrhaphy, hysterectomy for fibro-myomata, carcinoma of the breast, uterine suspensions.

The cause of wound infection in Nos. 1 and 2 is obvious; infective material is either actually present in the tissue incised (1), or pus immediately pours over the wound margins (2). In No. 3, it is possible that infective material from within has come into direct contact with wound margins; an early appendicitis will often have a few drams of straw-colored fluid about the appendix; this flows out over the wound margins and may implant micro-organisms. In dealing with the stump of an "interval" appendix it is possible to contaminate the field. The same holds with cholecystectomy—possible contamination from the stump of the cystic duct.

The following is an interesting example of probable wound contamination from within: A case, wrongly diagnosed "Acute Empyema of the Gall Bladder" was opened in the gall bladder region. The gall bladder, on inspection and palpation, seemed normal. A hand was passed into the pelvis and encountered a large mass in the tubo-ovarian region having all of the characteristics, on palpation, of a tubo-ovarian abscess. The hand was instantly withdrawn. There was no visible infective matter on the glove. The wound was closed without drainage and the abscess drained vaginally. By the third day the upper wound showed signs of active infection, some stitches were removed, and a large amount of foul smelling pus was evacuated. Undoubtedly the mere touching of the gloved hand to the diseased tube and then withdrawing it through the clean wound caused the contamination of the margins producing a large subcutaneous abscess.

The problem then seems to narrow down largely to causes of post operative infection of wounds in No. 4 class.

POSSIBLE METHODS OF INFECTION

From Without: Dust particles circulating in the operating room. It is well known that petri dishes of ordinary culture media have been exposed in operating rooms for only three minutes and cultures of pyogenic organisms obtained. While performing an "exploratory laparotomy" in which no pathological lesion was found, un-

*Read before the South Chicago Branch of the Chicago Medical Society, April 29, 1930.

less it was the proverbial "chronic appendix," which was removed, some one kicked the standard of the lamp which stood at the side of the table, the lamp itself extending over the operative field. Some dust particles were observed to fall from the lamp on to the operative field. The patient developed a general peritonitis and died. Cultures were made from the metal parts of the lamp and pure growths of staphylococci were recovered. This is not proof, perhaps not even convincing, but it is at least suggestive.

Gauze, linens and other operating room paraphernalia may be septic due to possible faulty sterilization (Dr. Kegel's work on hospital sterilizers brought this out), or they may have become contaminated in some unknown way after thorough sterilization. There was an example of this in one of the large charity hospitals several years ago. There had been more than the usual number of infected wounds. On investigation it developed that it was not confined to one or two services, but that all were having them in about equal number. Further investigation brought out the fact that, irrespective of which one of the staff performed the operation, the infections were coming largely from one operating room. After some further "detecting" it was discovered that a scrub woman who cared for that particular room would remove a sterile towel from a drum, unfold it, sweep on to it the finer dust and refuse, shake it into the refuse can, carefully refold the towel and *replace it in the drum!*

It is possible that suture material at times is not sterile. There may be slips in asepsis in adjusting gloves or gowns. A needle prick in a glove during an operation is a potent source of infection. Regardless of how carefully the surgeon's hands are scrubbed and prepared, confined in rubber gloves they will perspire more or less. It is conceivable that pyogenic organisms, inhabiting the depths of the sweat glands of the hands are washed out by the perspiration into the glove finger tips; from here it can readily escape through a needle puncture into the wound and so be a definite cause for infection of that wound. The peritoneum can usually take care of whatever of infection reaches the abdominal cavity in this way; the abdominal wall, especially the subcutaneous layer, not so easily and so we may have the "infected postoperative wound." Breathing, talking, sneezing, or coughing over the field or near it could be factors.

The Wound Itself: Exposed skin; repeated "skidding" with retractors or hands from skin surface into the wound; wiping with gauze sponges from skin into the wound and using the same sponge more than once. Foreign bodies, sterile in themselves, but acting as irritants to lower local resistance of tissue; cat-gut ligatures, sediment from sterilizers, glove powder. Dr. De Lee frequently emphasized this point in his lectures and urged all surgeons to carefully wash off the powder from the outside of the gloves after donning them before beginning work.

Gauze dressings applied to wound surfaces, as a confrere recently remarked to me, are not Berkefeld filters. It is surely possible for bacteria to reach a wound through an ordinary surgical gauze dressing. However, wounds are practically always sealed by blood crust within an hour after closure. During my interneship some German surgeon published a series of cases in which no post operative dressings were applied. We thought that if the Germans could do this we could also, so sent approximately one hundred cases to the wards from the operating rooms without a dressing of any kind. Our percentage of wound infections was no larger in this series than in our dressed cases.

Hemotogenous Infections: This brings up the entire subject of focal infections with metastasis to more or less distant regions where resistance has been lowered by trauma, disease, fatigue, or what-not. I will not enter into this except to mention an editorial which appeared in the *Journal A. M. A.* of Feb. 1, 1930, referring to some original experimental work done by Sager and Nickel (Arch. Surg. Dec., 1929). These experimentors produced abscesses by the subcutaneous injection of silver nitrate. They aspirated these abscesses and found them to be sterile. They then injected easily recognized bacteria into the blood stream, following which these abscesses became secondarily infected with the identical organism injected. Contamination was practically ruled out because of the prior aspiration. In their series of experiments these areas frequently showed infection occurring even after the blood cultures had again become sterile. Their conclusions were that surgical procedure

lowered resistance of these areas and so attracted micro-organisms circulating in the blood stream.

Bacteria Planted by the Operator at the Time of Operation: In spite of the fact that the skin surface has been prepared by shaving, thorough scrubbing and washing, and by the application of one or more of the several "antiseptic" solutions in vogue, there are still bacteria present in the deep crypts of the skin, the hair follicles, sebaceous and sweat glands. An entirely sterile knife is grasped by an equally sterile gloved hand and forced through these pockets, picking up a few organisms and planting them in the fatty layer. The skin cutting knife is discarded and sterile towels are carefully clamped to the wound margins before the deeper structures are molested. Even so the *inoculation has already been made!*

Now, added to this are the following factors: 1. Lowered general resistance, by the patient's immediate illness or at least by the surgical procedure and anesthetic; 2, lowered local resistance by the trauma of the incision, increased perhaps by infiltration of a local anesthetic solution; 3, the implanting of foreign bodies which act as mechanical irritants—absolutely sterile cat-gut ligatures. In individuals having a deep layer of subcutaneous fat with many bleeding points, this is especially true, as is evidenced by a much higher percentage of so-called "stitch abscesses" in this type of patient. This layer has the lowest resistance to infection. 4. Exposure, handling, length of operation, retractor pressure, all play a part in lowering the resistance of this tissue. 5. In closure of surgical wounds surfaces are not as accurately approximated as we sometimes suppose; there is more or less oozing into dead spaces with resulting small hematomata—excellent culture media for these implanted organisms.

It is my personal opinion, not based on experimental data, but merely on clinical observation, that post-operative wound infections—so-called "stitch abscesses"—while it is conceivable that they can be caused, and even in a small percentage of cases, may be caused, by an agent from without, or by the blood stream, are actually caused, in by far the greatest number of cases, in the manner I have last described; that the organisms are picked up in the deeper skin structures and planted into the subcutaneous fat; there they fight out the battle with the resisting powers of the patient; when the patient loses, the result is—STITCH ABSCESS.

55 E. Washington St.

THE PRESERVATION OF THE PARATHYROIDS IN GOITER SURGERY*

GEORGE M. CURTIS, M. D., F. A. C. S.**

CHICAGO

The occurrence of a specific form of tetany following total extirpation of the parathyroids is now established both clinically and experimentally. The evidence for this statement is so extensive that we will not take the time to attempt to cover it, since this has been done.[1] As a consequence to this fact, the protection of these glandules has become one of the necessities of a correct thyroid surgery.

It is to be remembered, however, in this connection, that tetany may follow operations upon other parts of the body, quite distant from the parathyroid region. It has been reported, for example, subsequent to the correction of hallux valgus, herniotomy and resection of the pylorus.[2] Recent experimental work has demonstrated, in addition, that there is a form of tetany associated with the demineralization following the transperitoneal perfusion of distilled water. This is accompanied by a definite loss of chlorides from the tissues and an hypocloremia.[3] Moreover, we have seen, experimentally, the blood calcium at one-third its normal level—as low as 3 milligrams per cent, without tetany.[4] These facts are presented simply to show that the tetany problem is far from its full solution. That there exists, however, a definite *tetania parathyreopriva* following the removal of all, or nearly all, of the parathyroids is, of course, generally accepted.

The prevention of parathyroid tetany subsequent to goiter surgery depends particularly upon a consideration of the anatomy of the parathyroids. Not only must a sufficient number of the glandules be spared, but to those remaining must be preserved an intact blood supply. The conscious preservation of a sufficient

*Read before the Section on Surgery, Illinois State Medical Society, Joliet, May 21, 1930.

**From the Department of Surgery of The University of Chicago.

number of the glandules, as well as their blood supply, calls for the knowledge of a number of factors, which we will discuss in the following order before considering their clinical application: (a) The number of glands which are present; (b) Their color, shape and size; (c) The position of the glands; (d) The direct blood supply; (e) The collateral blood supply.

Number of Glands Present. The parathyroid glands are of entodermal origin and develop from the lateral portions of the third and fourth pharyngeal pouches. There are ordinarily four separate anlagen. From these, cords of cells migrate into the region of the hypopharynx, and later, with the thyroid, into the neck.[5] It is evident that with four distinct origins we may find occasionally an increased number of parathyroid glandules due to the separation of original anlagen. It is likewise evident that in the migration, the four small, separate glandules may readily take different positions than those ordinarily assumed. Authorities have differed considerably in the number of parathyroid glands which they have found in dissections on cadavers.[2, 6] The differences in their results may be interpreted in two ways, however. First, there may have been fewer glands present than normal, and, second, the search may not have been sufficiently extensive. It *is* difficult in the cadaver to identify the parathyroid glands with any degree of certainty.[12] Grossly they may be confused with accessory thyroid glands, with lymph glands,[7] with small lobules of fat, or even with hemolymph glands[8]. The only certain way of identifying the parathyroid glands is by means of microscopic sections. In a search recently made on twelve cadavers, I found four parathyroids in ten, five parathyroids in one and three parathyroids in one. These were all identified and proved to be parathyroids by means of frozen sections.[12] As a rule four glands are found; according to Klose, in about 80 per cent. of the bodies examined.[2] The principal variation, however, is toward a lesser number.

Color, Shape and Size. The color of the parathyroid glands is of importance in their identification, particularly during goiter surgery. It is dependent upon their content of blood and fat. In the usual adult patient with thyrotoxicosis either with a diffuse hyperplastic or a nodular goiter, the parathyroids glands are of a yellowish brown color. In older individuals, or those who are emaciated, they may become of a more pinkish tint. In a dry field, it is possible to recognize them in a considerable number of cases.

The shape of the parathyroids is variable. Ordinarily they are from three to ten millimeters in length, two to four millimeters in breadth and one to four millimeters in thickness. They are usually elongated or ovoid in shape, those lying between the thyroid gland and the enclosed cervical viscera being as a rule flattened. Larger and smaller glands, of course, exist. The shape and color, or even the position, are not of sufficient value to enable one to identify the glands with any great degree of certainty. For that reason, for any assurance in transplanting them, one should make a frozen section, even with the understanding that a part of the valuable tissue must be sacrificed to do so. Small accessory thyroid glands are frequently confused with the parathyroids. These, as a rule, however, are darker in color, larger, lobulated and attached to the thyroid capsule. The lymph glands are usually lighter, firmer, and more definitely spheroid or ovoid in shape. Both lymph glands and parathyroids have a single penetrating artery, which is confusing. Fat lobules may occasionally resemble parathyroids, particularly when the fat is in an undeveloped state and the lobules of a brownish color. The prevertebral lymph glands resemble parathyroids, and the hemolymph glands resemble them even more closely, owing to their vascularity.[8] Finally, if a glandule is removed and transplanted without microscopic confirmation that it is a parathyroid, one cannot be certain that a true transplantation has been done, either autogenous or heterogenous.

Position of the Glands. The parathyroids lie, as a rule, in a broad zone along the posteromedial surface of the thyroid lobes and commonly between them and the enclosed cervical viscera. This *"danger zone"* is well recognized and thanks also to the position of the adjacent recurrent nerves, a sufficient number of parathyroids is usually spared in subtotal resections of the lobes. However, variations from this usual position occur and it is particularly these anterior lying aberrant glandules which are likely to be removed. Aberrant parathyroids, though known for years,[2] have recently received renewed

attention, particularly in relation to resected thyroid lobes.[9, 10] Wellbrock[11] found that about 8 per cent. of 1,056 glands removed at the Mayo Clinic revealed parathyroids upon careful investigation. It thus becomes of increasing importance to spare as many glandules as possible, and to maintain an intact blood supply to those which remain.

The majority of the parathyroids, however, lie between the thyroid fascia and the thyroid capsule within the thyroid space,[13] in a zone between the thyroid, trachea and esophagus. In this situation they are in intimate relationship with the anastomotic vessels between the thyroid arteries and those of the respiratory and digestive tubes. Collateral vessels between these structures and their enveloping fasciae pass through this zone and the parathyroid arteries may even arise from them.[6, 14, 15] A knowledge of this position and relationship, recognized by Halsted[16] on the basis of McCallum's dissections and designated by de Quervain the *"danger zone,"* is of manifest importance in preserving the parathyroids as well as their collateral blood supply during subtotal thyroidectomy.

The parathyroids lie, as a rule, free within this thyroid space. It is very rare to find one embedded within the thyroid substance or even within the thyroid capsule. They may occur outside this space particularly below the lower pole. The majority of the glands lie along the lower three-fourths of the lobes and are more commonly below the lower pole than above the upper. Due to their development and subsequent migration, they may be found anywhere along the course of the developing thyroid. A striking example of aberrant parathyroids is to be found in a case reported by Asch.[17] This patient had a lingual goiter which was removed on account of its interference with respiration and deglutition. Not only myxedema but even parathyroid tetany followed the extirpation. A careful examination of the specimen revealed the presence of parathyroids within the tissue excised from the base of the tongue. Parathyroids likewise sometimes occur within the thorax,[28] or at the tip of the pyramidal lobe.

The Direct Blood Supply. Since the studies of Welsh[18] and later of Halsted and Evans,[14] which have been abundantly confirmed, it has been generally recognized that the parathyroids receive their blood supply principally from the inferior thyroid arteries. From this anatomical fact it would seem that these arteries should be carefully preserved during operations upon the thyroid gland. This view has actually been expressed, more recently by Dunhill.[19] However, as a matter of clinical experience, bilateral ligature of the inferior thyroid arteries[24, 29] or, for that matter, of all four thyroid arteries[20, 22] is but rarely followed by tetany.[21, 23, 25]

The parathyroids receive a characteristic single artery of variable length which is one of the distinguishing features in their identification. This arises commonly from a branch of the inferior thyroid artery, frequently just after the trunk branches to ramify within the capsule of the thyroid gland. In excised specimens parathyroids may sometimes be identified by following along the course of these larger branches. Occasionally the slender artery may arise from a branch of the superior thyroid artery, as figured by Ginsberg.[7] Frequently it arises from an anastomotic branch, the *"channel"* of Halsted, connecting the superior with the inferior thyroid artery on the posterior or postero-lateral surface of the thyroid lobe. There are no visible anastomoses between the gland sheath and the surrounding connective tissue. The parathyroid arteries may arise from any of the terminal branches of either of the two thyroid arteries. They may arise from the inferior laryngeal artery, from the esophageal arteries or from those destined to go to the trachea or pharynx.

The Collateral Blood Supply. We have recently studied the blood supply to the human parathyroids, particularly the collateral blood supply, in a series of twenty-five cadavers immediately preceding necropsy.[12] The following is a summary of that study. An especially devised injection apparatus was employed.[25] A carmine-gelatin mass was injected into the lower thoracic aorta, below the origin of the bronchial and esophageal arteries, at a pressure of 150 mm. of mercury. By preliminary ligature of unnecessary arteries leading away from the neck, the injection was localized largely to the thyroid area. Abundant anastomoses were demonstrated between the thyroid arteries, especially the inferior, and the arteries of the larynx, pharynx, trachea, esophagus and their surrounding muscles and fasciae. Connecting vessels may be

readily traced to these structures. Terminal branches of both thyroid arteries anastomose across the isthmus, and behind the isthmus with tracheal vessels. The larger collateral vessels below, from the inferior arteries, are the inferior laryngeal, the esophageal and tracheal branches, and those to the isthmus. Above, the collaterals arising from the superior arteries, are the superior laryngeal, pharyngeal and muscular branches, and the cricothyroid arteries. There is also a free anastomosis between the two thyroid arteries, particularly on the posterior surface of the gland, but to a certain extent also within its substance.

After preliminary ligation of both inferior thyroid arteries, the presence of carmine gelatin was demonstrated in the parathyroids after injections, by means of frozen sections. After ligature of both inferior thyroid arteries, together with the anterior branches of both superior thyroid arteries, the injection mass was demonstrated in the parathyroids by the same method. In three bodies all four arterial trunks were ligated preliminary to the injections. The mixture was subsequently demonstrated in the vascular spaces of the parathyroids. The fascial connections posteriorly between the thyroid and the trachea and esophagus, particularly in the region of the isthmus and the medial borders of both lobes, are important in maintaining this collateral blood supply.

In the Surgical Clinic in Berne it is a frequent procedure to ligate both inferior thyroid arteries as a hemostatic measure preliminary to a thyroidectomy[24, 25]. In many instances the anterior branches of the superior arteries are ligated at the same time. In less than 1 per cent. of the cases all four of the arterial trunks are ligated. Since tetany does not follow these procedures it is apparent, from extensive clinical evidence, that the collateral blood supply to the parathyroids is ample. The demonstration of injection mixture in the parathyroid glands following the preliminary ligature of both inferior thyroid arteries, and even of all four thyroid arteries, substantiates this conclusion and places it on a firm experimental basis.[12]

Clinical Application. From studies upon the cadaver and at the operating table which we have made, as well as after consideration of the work of others, we wish to present the following principles of technique which appear to assure the maximum chance of preserving the parathyroids in goiter surgery. Since they usually lie in the space between the thyroid fascia and the thyroid capsule, when this space is entered the operator should be careful to strip back the thyroid fascia in exposing the anterior and lateral portions of the thyroid lobes. When the anterior portion of the lobe is sufficiently exposed, the remainder of the excision should be made intracapsularly, preferably after a method similar to that which Terry and Searls have recently outlined,[26] in order to preserve the entire lateral and posterior capsule and particularly the thyroid fascia and space content. The superior thyroid artery should be ligated close to the superior pole, in order to preserve the muscular and visceral branches (pharyngeal, laryngeal and cricothyroid), particularly those arteries which maintain the collateral supply to the parathyroids even when the four trunks are lighted. The inferior thyroid arteries should be ligated outside the thyroid fascia and capsule, preferably after the method outlined by de Quervain,[24] in order to avoid injuring the "danger zone" and direct branches to parathyroids. In the resection of the lobes, the fascia and capsule about the inferior pole should be particularly preserved. It is possible to do this. Also it is advisable to leave a thin layer of isthmus covering the trachea, since here there is an evident collateral supply. In the preservation of the finer connecting branches which form the important collateral supply to the parathyroids, it is necessary to refrain from excessive traction upon the thyroid gland during its luxation and resection. Immoderate traction can result in the destruction of the finer collateral vessels between the medial surfaces of the lateral lobes and the trachea and esophagus. Since it has been shown that parathyroids are frequently removed in resections of the thyroid gland, Lahey[27] has recommended that these be identified and reimplanted, preferably in the sterno-mastoid muscle.

If the collateral supply to the parathyroids is carefully preserved, we may with safety ligate all four thyroid arteries if necessary, the two superior arteries close at the superior pole and the two inferior arteries at the horizontal portion behind the carotids. The occurrence of parathyroid tetany following operations upon the

thyroid gland, in which these principles are followed, is very rare[25]. In one hundred and twenty successive operations for goiter which I have performed, and which have been followed, I have had but one transient case of demonstrable tetany. This was in a patient with a circular goiter. In the luxation of the high superior pole and the posterior portion of the lateral lobes, which extended medially behind the trachea, there was presumably injury to the collateral blood supply of the parathyroids. The transient tetany lasted three days. It has recently recurred since the patient left the hospital.

SUMMARY

The preservation of the parathyroid glands in goiter surgery calls for a knowledge not only of their position but also of their blood supply. Four glands are ordinarily present, of a brownish-yellow color, and lying, as a rule, between the medial surface of the lateral lobes and the trachea and esophagus but more frequently toward the lower pole of the thyroid gland. Each receives an individual artery, usually arising from the inferior thyroid arteries or their branches. Through the branches from which they arise, there is an abundant collateral blood supply from the other thyroid arteries of the same and opposite sides, from the arteries of the pharynx and esophagus, from those of larynx and trachea, from surrounding muscular branches and from branches in the deep cervical fascia. The preservation of this collateral supply is best effected by leaving the posterior and medial capsule, as well as the posterior isthmus, *in situ* and avoiding tugging on the gland in the luxation necessary to subtotal resection. Aberrant parathyroids are best preserved by leaving behind so much of the lateral and inferior polar fascia and capsule as possible.

BIBLIOGRAPHY

1. Guleke, N.: Neue Deutsche Chirurgie, Vol. 9, 1913.
2. Klose, H.: Neue Deutsche Chirurgie, 44, 123, 1929.
3. Curtis, G. M.: Hypochloremia, Cal. and West Med. (In Press).
4. Curtis, G. M., and Pacheco, G. A.: Proc. Soc. Exp. Biol. and Med., 26, 874, 1929.
5. Kursteiner, W.: Anat. Hefte, 11, 391, 1899.
6. Geis, N. P.: Ann. Surg. 47, 523, 1908.
7. Ginsberg, N.: J. A. M. A. 58, 1668, 1912.
8. Millzner, R. J.: Personal Communication.
9. Terry, W. I. and Searles, H. H.: J. A. M. A. 89, 966, 1927.
10. Millzner, R. J.: J. A. M. A. 88, 1053, 1927.
11. Wellbrock, W. L. A.: J. A. M. A. 92, 1821, 1929.
12. Curtis, G. M.: The Blood Supply of the Human Parathyroids, Surg. Gyn. and Obs. (In Press).
13. de Quervain, F.: Goitre, Wm. Wood & Co., New York, 1924.
14. Halsted, W. S., and Evans, H. M.: Ann. Surg. 46, 439, 1907.
15. Ginsberg, N.: Med. Bull. Univ. Penn. 20, 256, 1908.
16. Halsted, W. S.: Surgical Papers, Vol. 2, page 162, Johns Hopkins Press, Baltimore, 1924.
17. Asch, R.: Deutsche Zeitsch. f. Chir. 130, 593, 1914.
18. Welsh, D. A.: Jour. Anat. 32, 380, 1898.
19. Dunhill, T. P.: Brit. Med. Jour., Vol. 1, page 1, Jan. 5, 1924.
20. Pettenkofer, W.: Beitrag, zur operativen Behandlung Zweiseitiger strumen. Beitr. z. Klin. Chir. 95, 275, 1914.
21. Enderlen, P.: Münch. Med. Wochen. 69, 1129, 1922. Klinische Wochenschrift, 1, 457, 1922.
22. Enderlen, E. und Hotz, G.: Zeitsch. f. angew, Anat., 3, 57, 1918.
23. de Quervain, F.: Beit. z. Klin. Chir., 128, 197, 1923.
24. de Quervain, F., and Curtis, G. M.: Surg. Gyn. and Obs., 43, 498, 1926.
25. de Quervain, F., and Curtis, G. M.: Die Kollaterale Blutversorgung der menschlichen Nebenschildrüsen. (In Press.)
26. Terry, W. I., Searls, H. H., and Millzner, R. J.: Medical Sentinel, Portland, Oct., 1928.
27. Lahey, Frank: Surg. Gyn. and Obs. 42, 508, 1926.
28. v. Verebély, J.: Virchow's Archiv, 187, 80, 1906.
29. de Quervain, F.: Surg. Gyn. and Obs., 23, 402, 1916.

DISCUSSION

Dr. Lindon Seed, Chicago: Parathyroid tetany is one of the most serious complications following thyroidectomy. It is commonly thought that tetany is usually temporary but from my own observations, if the patient is followed over a number of years, there is a partial but permanent disability.

When an assistant to Dr. W. E. Sistrunk, I had an opportunity to see a series of cases in which four pole ligations were performed, usually in stages. These cases when they returned for thyroidectomy seemed to bleed more than the usual thyroidectomy. There was not a great deal of improvement from this procedure and there was no tetany. Dr. Curtis has shown that, apparently, interference with the four main vessels will not produce tetany, that the collateral supply is sufficient to carry on. He has called attention, however, to the fact one must preserve some of the collateral, of which the most important single source is the anastomotic branch between the inferior thyroid and the superior thyroid. Some surgeons destroy this branch in removing the entire gland above the level of the cricoid. Such an operative procedure might result in tetany if both inferior thyroids were ligated simultaneously. Sometimes in applying a single principle in another surgeon's operation to one's own operation, unless he takes into consideration all the other factors, he can get into a great deal of trouble. One surgeon who leaves the upper part of the gland or who leaves a large portion of the gland can ligate the inferior thyroid with impunity, while another one will produce tetany.

No one can be too familiar with the position of the parathyroids. They are difficult to see during the course of an operation and can be differentiated from thymus, accessory thyroid or a lymph gland only by microscopy. Dr. Curtis' demonstration of their position and more important, the fact that the inferior thyroids can be ligated without necessarily causing tetany is certainly of considerable value in the operating room.

THE WASSERMANN REACTION IN ASTHMA

RUDOLPH HECHT, B.S.
From the Department of Pathology and Bacteriology, University of Illinois College of Medicine
CHICAGO

During the course of the last ten years much evidence has accumulated which indicates that non-specific factors play an important part in the treatment of syphilis, probably as important, from the viewpoint of practical therapeusis as are specific chemo-therapeutic agents. Indeed, there is a growing conviction that our specific chemo-therapeutic agents act largely because of a non-specific effect on the tissues, and the tissues in turn react to the virus.

There is no doubt that the treatment of paresis by means of malarial infection has done much to emphasize this point of view. As a matter of fact non-specific therapy in the earlier stages of syphilis frequently gives equally striking results.

Bering[1] states that early syphilis, especially if refractive to treatment by arsenic and mercury should be treated with malaria. He states that the malaria cure when applied to early lues is a prophylactic against subsequent neurosyphilis. Memmesheimer[2] has used the malaria treatment in early syphilis with great success. Kerl[3] also speaks well of the use of malaria therapy in early syphilis. Herrold[4] has used gonococcus protein intra-muscularly plus neoarsphenamine intravenously in "Wassermann fast" individuals with gratifying results. Weirauk[5] has found that syphilitic skin lesions showed marked improvement or even regression following milk injections. Greenbaum and Wright[6] have shown that non-specific protein therapy results in partial or complete involution of secondary or tertiary lesions. Mulzer[7] has shown that persons with a strongly positive Wassermann reaction are markedly benefited by malaria therapy. Finger[8] is a strong advocate of the malaria-salvarsan treatment of all forms of syphilis. Bering[9] does a cisterna puncture at the end of the second year of treatment. If the cerebrospinal fluid shows evidence of syphilis, he immediately institutes malarial treatment. He has been very successful in 460 cases.

In this country Engman of St. Louis has been particularly interested in non-specific therapy in syphilis, checking his results by means of quantitative Kahn tests. He has used a variety of non-specific methods either singly or combined and his results have been very interesting.

The methods used in non-specific therapy are varied. Almost every protein has had its day. Malaria, introduced by v. Jauregg, has been widely used. A few of the clinicians who have used malaria therapy are: Nonne,[10] Hoff and Klauders,[11] Ebaugh,[12] Bering,[13] Dreyfuss and Hanau,[14] and O'Leary.[15] Tuberculin, typhoid vaccines, milk proteins, organic sulphur compounds, "Transfusum," "Pyrifer," Ringer's solution, heat, cold, diathermy, ultra-violet light, x-ray and innumerable other agents have been used in non-specific therapy.

In the early days of non-specific therapy many explanations were advanced for the mechanism whereby the effects were produced. Wagner von Jauregg thought that the fever was an important factor, i. e., the heat produced. This, of course, may be an aid in the inactivation or destruction of the spirocete. Scherber[16] and Kundratitz[17] believed that there was a mobilization of the organisms into the blood stream after the injection of foreign protein, and concluded that the defences of the body took care of the destruction of these organisms after they had been ejected from their protected seclusion in this manner. Numerous other explanations which cannot be cited in this paper have been advanced. Recently, however, due to the application of exact quantitative methods to the study of the reaction after non-specific therapy, it has been shown that practically all of these "Reitzkörper" act in the same way. There are two phases to the reaction. Phase 1 is characterized by a fever; phase 2 by a reaction after the fever and a return to normal. The first state is characterized by an acidosis, the second state by an alkalosis. Jobling,[18] Scully,[19] and E. F. Müller[20] have shown that there is a leucocytosis following the injection of foreign protein. Camie and Calhoun[21] demonstrated that this leucocytosis was accompanied by a myeloid tendency. Petersen has shown that the fibrinogen is increased, thereby decreasing the coagulation time. Jobling and Petersen[22] have demonstrated the increase in proteolytic enzymes. Eggstein[23] indicated that there was an acidosis followed by an alkalosis. Barr and associates[24] have shown changes in the metabolic rate. Petersen[25] has

demonstrated that there is an increased permeability, followed by a decreased permeability. Mueller and Petersen[26] have shown the dominance of the sympathetic. Numerous other changes in the individual following non-specific therapy have been studied, but cannot be mentioned here. Hoff[27] nicely summarizes the important changes which occur as follows:

PHASE 1

1. The rising fever. The established fever.
2. Leucocytosis with a myelogenous tendency.
3. Lowering of the alkali reserve.
4. Increase in metabolism.
5. Increased destruction of protein.
6. Increase in the blood sugar.
7. Lowering of the blood cholesterol.
8. Dominance of the sympathetic.

PHASE 2

1. The decline of the fever.
2. Decrease in the leucocytes with a lymphatic tendency.
3. Rise in the alkali reserve.
4. Decreased metabolism.
5. Lowered destruction of protein.
6. Decrease in the blood sugar.
7. Rise in the blood cholesterol.
8. Dominance of the parasympathetic.

Thus we see that the injection of foreign protein has quite a profound effect on the organism. According to many recent investigations, anything which changes the individual's reaction stimulates the tissues to the destruction of the spirochete. Of special significance is the leucocytosis with the "shift to the left." Not only do we have defensive mechanisms of this type stimulated in the injection of foreign proteins, but according to Hektoen, Pheiffer, Weichardt, Fränkel and many others, we also have a concomitant rise of all of the immune bodies. It is not difficult to comprehend that having a syphilitic infection, the stimulation to the production of all immune bodies would also stimulate the production of the anti-bodies for syphilis. Not only does the injection of protein have a non-specific effect, but even mercury is said to exert its action by a non-specific effect. It is said that the concentration of mercury which is attained by injection and inunction is insufficient to destroy the spirochete. Bergel[28] has shown that the mercury acts on the lymphocytes about the spirochetes, destroying the lymphocytes and liberating the enzymes. The effect of the mercury is said to last only as long as lymphocytes are present.

The Relation of Asthma to Syphilitic Infection. True bronchial asthma is a protein sensitization. Every time the asthmatic has an attack he reacts to a foreign protein comparable to that resulting from the injection of foreign protein in the treatment of syphilis. It has been shown that the asthmatic possesses an unstable vasomotor system. These individuals are the so-called vagotonic type. Borchardt[29] tersely describes these individuals when he says that they possess a "reizbare Konstitution." They are "hypersensitive" and hyper-reactive. At the present time the belief is that the reason why the chronic diseases respond to non-specific therapy, is because of the fact that the non-specific agent "shakes up" the normal individual, and where he was stable before, now makes him unstable and reactive, causing his tissues to react to the virus with which he is afflicted. The asthmatic, on the other hand, is already "wound up," and therefore it is understandable how such an individual might easily dispose of a luetic infection. As has been shown above, early lues is influenced by non-specific protein therapy, and if anyone is receiving protein shocks, the asthmatic certainly is. Thus the asthmatic might remain relatively free from clinical manifestations of syphilis, or show a negative Wassermann reaction, even in the face of a history of a chancre without treatment.

CLINICAL RECORDS

I have recently had occasion to examine clinical records of asthma cases for the year 1929 and 1930 at the Cook County Hospital. Among these the following five cases indicate a syphilitic infection in which there was no history of treatment. All were Wassermann negative:

No. 11188820—J. K., white, aged 43. Chancre 12 years ago. W—now.
No. 1132479—F. B., colored, age 55. Chancre 19 years ago. W—now.
No. 1139849—J. D., colored, age 55. Chancre 15 years ago. Kahn—now.
No. 1141959—R. T. white, age 44. Chancre 24 years ago. W—now.
No. 1148684—S. C., white, age 45. Chancre 26 years ago. Kahn—now.

Asthma would therefore seem to confer an immunity to syphilis. It would be especially interesting to observe the incidence of neurological lues in asthmatics.

With the idea in mind of proving or disproving the general idea, the records of bronchial asthma cases at Cook County Hospital since 1927 were inspected. The incidence of positive tests on all services at Cook County Hospital for 1928

1930 was 18.4 per cent. It is a striking fact that the incidence of positive tests in asthmatics was much less: 2.5 per cent. We must not lose sight of the fact that at Cook County Hospital many diagnoses such as cardiac asthma, tuberculosis, aortic aneurism, bronchitis, etc., may be classified with bronchial asthma, and that therefore many of the asthma cases with positive Wassermanns should actually have been classified in the above named groups.

The following are summaries of the asthma cases for 1927, 1928, 1929 and 1930 (to April) at the Cook County Hospital in Chicago:

1929-1930

No. of Cases	W. or K. Negative	W. or K. Positive	W. or K. Not Recorded	Cardiac Asthma, etc.
103	70	1++	32	1 Car. As.+++ 1 Myocard. ++ 1 Car. As. —

1927-1928

No. of Cases	W. or K. Negative	W. or K. Positive	W. or K. Not Recorded	Cardiac Asthma, etc.
203	106	1+++ 3++	97	1 Car. As. ++ 2 Car. As. — 1 T. B. ++++

We see, therefore, that the incidence of positive Wassermann or Kahn tests in bronchial asthmatics at Cook County Hospital is 2.86 per cent for 1927-1930. Taking into account the cases which were possibly cardiac asthma or tuberculosis, we get an incidence of 4.92 per cent. Even this is very much lower than the average at Cook County Hospital.

The observations recorded above indicate that the incidence of positive luetic reactions in bronchial asthmatics is lower than the corresponding hospital group, and suggest the possibility that the repeated "shock reaction" to which asthmatics are subject influences the course of syphilis when present.

REFERENCES

1. Bering, F.: Wien. Klin. Wschr., 1928, 41, 977.
2. Memmesheimer, A. M.: Arch. f. Dermat., 1928, 156, 500.
3. Kerl, W.: Arch. f. Dermat., 1929, 157, 294.
4. Herrold, R. D.: J. A. M. A., 1926, 86, 413.
5. Weirauk, H. V.: Ohio State Med Jour., 1926, 22, 305.
6. Greenbaum, S. S., and Wright, C. S.: Arch. Dermat. and Syph., 1925, 12, 858.
7. Mulzer, P.: Dtsch. Ztsch. f. Chir., 1927, 203-204, 654-668.
8. Finger, E.: Wien. Klin. Wschr., 1828, 41, 771.
9. Bering, F.: Münch. Med. Wschr., 1926, 73, 2016.
10. Nonne, M.: Med. Klin., 1926, 22, 1520.
11. Hoff, H., and Klauders, O., Ztschr., f. d. ges. Neurol. u. Psychiat., 1926, 104, 306-322.
12. Ebaugh, F. G.: Colorado Med., 1927, 24, 163.
13. Bering, F.: Deut. Med. Wschr., 1926, 52, 1611.
14. Dreyfuss, G. L., and Hanau, R.: Klin. Wschr., 1927, 6, 590.
15. O'Leary, P. A.: J. A. M. A., 1928, 91, 543.
16. Scherber, G.: Wien, Klin. Wschr., 1926, 39, 1325.
17. Kundratitz, K.: Monat. f. Kindhk., 1927, 37, 501.
18. Jobling, J. W.: Arch. Int. Med., 1917, 19, 1402.
19. Scully, F. T.: J. A. M. A., 1917, 69, 20.
20. Müller, E. F.: Ztschr. f. d. ges. Exp. Med., 1923, 32, 120.
21. Camie, D. M., and Calhoun, H.: Arch. Int. Med., 1919, 23, 69.
22. Jobling, J. W., and Petersen, W. F.; J. A. M. A., 1915, 65, 515.
23. Eggstein, A. A.: J. Lab. and Clin. Med., 1921, 6, 481.
24. Barr, D. P., Cecil, R. L., and DuBois, E. F.; Arch. Int. Med., 1922, 29, 608.
25. Petersen, W. F.: Protein Therapy, etc., Macmillan, New York, 1922.
26. Mueller, E. F., and Petersen, W. F.: Klin. Wchschr. 1926, 5, 53.
27. Hoff, Unspezifische Therapie, Springer, Berlin, 1930, p. 11.
28. Bergel, S.: Klin. Wschr., 1922, 1, 204.
29. Borchardt, L.: Klinische Konstitutionslehre, Urban und Schwarzenberg, Berlin u. Wien, 1930.

DIAGNOSIS AND TREATMENT OF ACUTE AND CHRONIC EFFECTS OF INJURIES OF THE HEAD*

WALTER E. DANDY, M. D.,

BALTIMORE, MD.

There is a quotation which seems very apt in the discussion of the treatment of head injuries. It reads like this: "Be not the first to accept the new nor yet the last to lay the old aside." For hundreds of years there has been a great difference in the mode of treatment of head injuries. A hundred years ago there was a very acute discussion of the subject in England by two of the greatest surgeons of that time. Percival Potts, whom you know through Potts' aneurysm and Potts' fracture, operated on all fractures of the head, while Sir Charles Bell, who is known so well because of his experimental work in neurology, let all fractures alone. It is always very difficult to tell in statistics who is right, and it is particularly so in the treatment of injuries of the head because they are so varied in degree and in extent. Today there is just as much difference of opinion as there was at the time of Potts and Bell. The reason is that there can be no standardized treatment for injuries of the head. They are too variable. Each case necessarily is a law unto itself. You may have one injury which is merely a concussion of the brain; you may have another with a tremendous hemorrhage, and a third with great edema. Of course, the statistical results are going to be dependent on the individual factors concerned

*Address before the Illinois Society of Industrial Medicine & Surgery, Joliet, Illinois, May, 1930.

in each case. Statistics are very bad when adjusted to such a variable condition as an injury of the head.

It is from the treatment of centuries back where the skull was treated and not the brain that the term, fracture of the skull, has been handed down. At the present time this is nothing more than a figure of speech. We are not concerned with fractures of the skull. We are concerned with what occurs in the brain. The figure of speech is retained. It is very much as we say, "the kettle boiling," when of course we mean the water in the kettle is boiling.

Potts operated in those days along the entire line of incision and would follow the crack from one end to the other, making a trephine opening the entire extent of the crack. Of course in those days they did not understand infection; they thought infection came from within, from extravasated blood. These trephine openings were made in order to let out what they considered infection of that origin.

I was recently very much impressed with a line of treatment which has, in fact, become almost vogue over the entire country. A patient will enter a big hospital and be sent immediately to the x-ray room. He will have stereoscopic x-rays taken, then he will be sent to the dispensary or the ward to have a lumbar puncture. If the cerebrospinal fluid is under pressure, some of it will be withdrawn. If the patient's condition is serious, he will have in addition, an intravenous injection of hypertonic glucose or hypertonic salt solution, then he will be sent to the ward and observed and perhaps the lumbar puncture will be repeated from time to time, for therapeutic or diagnostic purposes, and he may have more intravenous therapy. I presume nine-tenths of the doctors treat injuries of the head in that way and still it seems such a harsh and unscientific way of treating patients. In the first place, it is bad because all patients are treated more or less alike and, as I have already said, you cannot standardize the treatment. We want to find out as nearly as possible what is going on in that patient's head and we can only learn that by careful study of the patient and continual watching from the time he enters the hospital. It is bad also because it is a treatment which has a great potential harm. We must be sure when a system of treatment is introduced that we are not going to do more harm than we are going to do good.

In the first place, there is no point in rushing that patient to the x-ray room. You are not at all interested in the fracture of the skull beyond the fact that there may be a depression and you can feel that just as easily as you can see it in the x-ray. It is not going to help us one bit to see a crack of several inches at one point in the head. There are many patients who are so ill that the movement from the stretcher to the x-ray table and back again, and to the dispensary or ward is the straw that breaks the camel's back. Many times I have seen patients in whom after the operation on brain tumors or other types of brain lesions the slightest movement when they were very ill meant the loss of that patient's life. Precisely the same holds after injuries of the head. If you will follow through the postoperative period of cases operated upon, there will follow precisely the same line of progress that holds after injuries of the head. There is probably very little use for an x-ray of the head under any circumstances. I will admit that for medicolegal reasons and because of the present state of legal advice and of trials as carried on by lawyers, that x-rays are useful but that is almost the only purpose that the x-ray serves. Rushing the patient to the x-ray room is entirely unnecessary. If you want an x-ray wait until your patient is out of danger.

Now about lumbar puncture, if one will use a little common sense he will get far more information about his patient's condition than he will from a lumbar puncture. It is not necessary to do a lumbar puncture to find out how much intracranial pressure there is. Watch the patient's pulse pressure, his respiration and temperature, and, above all, watch the state of the patient's consciousness. Then you will know far more about what is going on in that patient than the man who has done a lumbar puncture.

The treatment is dependent upon what is going on in the head. Precisely the same thing is going on within the head that happens when you strike your hand, two things, edema and hemorrhage. Just as a blow on the hand will produce edema and hemorrhage of the palm and fingers, so it is in the brain. You may get much hemorrhage and little edema or you may get much edema and little hemorrhage. Now injuries of the head are serious because of intracranial pres-

sure almost entirely. Intracranial pressure results from the amount of edema and the amount of hemorrhage combined. When that amount reaches a certain quantity, then of course life cannot be sustained longer and our object in studying the patient so carefully is to find out when the point is approaching at which nature can no longer make compensation for this volume of edema and hemorrhage. Nature has remarkable powers of compensating for the new volume of edema, fluid and blood. She can adjust the intracranial chamber by pressing out the cerebrospinal fluid into spaces inside and outside the brain. The space outside the brain collapses and the fluid passes into the blood vessels. As the volume of the brain increases, the ventricles decrease and so she gets a space adjustment equal to the volume. How do we know by studying the patient's symptoms when he has passed beyond or up to that point of adjustment? We know by the slow pulse. Up to a certain point in the compensation of intracranial pressure the pulse will be slow and when the pulse cannot be increased in rate, then we know that there is beginning a break in compensation. We know by the respirations. As long as the respirations are slow and regular we know that nature is compensating for that volume of blood and fluid. When they become rapid and irregular, we know a break is coming on. Now temperature is a very important index also, perhaps one of the most constant indications of pressure we have. As long as the temperature remains below 101, 101.5 or even 102 compensation is taking place. When the temperature rises above that point we know that the pressure is rising above compensation and then there will be a steady rise commensurate with increasing pressure. Perhaps as important as all of these is the state of consciousness. If you watch the patient carefully and note his state of consciousness to question or supraorbital stimulation or whether that state of consciousness is increasing or decreasing, you know pretty well how that patient's condition is. Now there is another factor and that is the state of restlessness. This state means in intracranial pressure what pain does in appendicitis; it is a warning sign. Nearly always a patient will pass through a stage of restlessness before deepening into coma. It is the most valuable sign we have. It may last for many minutes, it may last for many hours, but you know that the patient is going on that very slender margin of safety when that restlessness is present. Of course, a patient coming out of coma will become restless but you will know whether the restlessness means improvement or not by the former state of consciousness. These very simple tests are far more useful than lumbar puncture in determining what is going on within the head.

Lumbar punctures are not harmless procedures; they are extremely dangerous procedures under certain conditions. It is perfectly true that patients tolerate repeated lumbar punctures, and yet there are certain types of lesions that will not tolerate lumbar puncture. I presume one of the best examples and the easiest to understand as to the danger of lumbar puncture comes in spinal cord tumors and precisely the same underlying factors hold in this condition as in injuries of the head. If in certain types of spinal cord tumor, particularly a dural endothelioma, one does a lumbar puncture the chances are very strong that immediately or within twelve hours that patient is going to lose sensory and motor power below the level of that tumor. If the patient has a cervical tumor and you do a lumbar puncture, it is a very simple thing. If you do a lumbar puncture under those conditions that patient may lose all the use of both arms and both legs in twelve hours, because there is a little higher pressure above the tumor than there is below, blocking the spinal cord. That little difference in the rate of pressure obtained by the fluid crams the spinal cord against the tumor, traumatizes it and paralysis results. If the tumor is in the medulla, alongside the medulla or in the cerebellum, instead of loss of motor and sensory function you get a loss of life. That we see over and over. There is not anything more dangerous to do in the presence of a brain tumor than a lumbar puncture. A lumbar puncture can be tolerated if the brain tumor is in the cerebrum, but if it is in the cerebellum, the chances of injury are very high. Now as I stated before, precisely the same conditions exist in injuries of the head. If you have a severe injury of the head and do a lumbar puncture, you are liable to get some injury to the brain stem and loss of life. If you do a lumbar puncture without knowing where the injury is and the degree of injury, you are taking a very unnecessary and very unwise chance.

Now there is one other condition in which lumbar puncture is extremely dangerous and that is in extradural hemorrhage. Every extradural hemorrhage ought to be diagnosed and the patient's life saved. There ought to be no mortality. Suppose you do a lumbar puncture in the presence of an extradural hemorrhage, what happens? In the first place, how does nature control bleeding from the middle meningeal artery which is the cause of extradural hemorrhage? Extradural hemorrhage results because the injury passes through the bone at the point where the middle meningeal artery is attached to the bone. It tears and bleeding occurs between the dura and the bone. That artery has little branches running from the vessel to the bone. As the hemorrhage increases in size, another of those little branches will be torn, so that it is a vicious circle. That is why extradural hemorrhage becomes so marked. Nature's method of controlling hemorrhage is by tampon of the brain, the pressure of the brain itself against the dura. If you do a lumbar puncture, what happens? The dura pulls away and automatically the bleeding points are again opened up in a new field and the hemorrhage immediately increases. If you want to see a rapid downward progress of a case in injuries of the head, you will see it in extradural hemorrhage after lumbar puncture. From these two causes alone it is evident that we are not justified in doing something for diagnosis that entails such a great risk.

Now does lumbar puncture ever do good? Perhaps we might be justified in using lumbar puncture with the dangers involved, if it did good in other cases, but does it? I do not believe it ever does. There is no question but that it will do good immediately. You see the patients improve immediately because of release of pressure, but what happens? There is bound to be a reaction. The fluid you remove is going to recur in greater extent and greater volume. You cannot do a lumbar puncture on an injured brain without adding trauma to the brain. The trauma you do with lumbar puncture is no different from the trama that occurred in the original injury. Now since lumbar puncture does not do good and does very great injury, it seems to me that it is dangerous to use it as a treatment under any circumstances.

Now about intravenous glucose and intravenous salt in hypertonic form. Here is a physiological fact which is beyond question. You can take a dog's brain and introduce so many cubic centimeters of a 25 per cent. salt solution and see the volume of the brain reduced tremendously. But what happens? In the first place, you are doing exactly what you would do in cases of lumbar puncture if there is extradural hemorrhage. There is almost certain to be a fatal result because you are taking away nature's way of stopping the hemorrhage. You cannot keep these injections up and you cannot repeat them every few hours, and besides the patient continues to get worse if you do.

What treatment would I suggest for injuries of the head? In the first place, study the patient as carefully as possible and there is not any part of neurologic surgery that needs more careful observation than injuries of the head. The cases that you see are going to be saved by careful watching. The more carefully you watch them, the more cases you are going to save. There are only about ten per cent. probably of injuries of the head that you are going to save by operative means. The operative means which we use are purely those of controlling the intracranial pressure. The operative procedure for controlling intracranial pressure is simply decompression. In perhaps 70 per cent. of the cases—the percentages vary of course—the patients are going to get well if you just let them alone. Nature is going to make adjustment of the intracranial pressure. If you are going to do intravenous injection and lumbar punctures, you are going to lose a certain percentage of that 70 per cent. Now we have to adjust ourselves to the fact that there are many injuries of the head that we are not going to be able to save, no matter what we do. They are far beyond any of our efforts. Now this rule is probably as good as we are able to evolve. This excludes extradural hemorrhage which you have to stop right away or you are going to lose the patient. If you will watch the patient for five or six hours and that patient begins to show signs of going downhill from intracranial pressure, he should be operated on by a simple subtemporal decompression. There was a time when most cases were operated on by decompression and the mortality was terrific. If the patient is going to die before five or six hours there is nothing you can do to save him. The pressure is far beyond the

degree where decompression will have any effect. There are, of course, many cases that you cannot save after five or six hours, but you can save ten per cent. by doing something and doing it at the right time. You cannot wait until signs of broken compensation are so pronounced, high temperature, high respiration. It is that ten cent. in which we must make our great effort to save the patient.

Now extradural hemorrhages are not common. Probably five per cent. of the whole number of hemorrhages are extradural. There is only one treatment for a patient with extradural hemorrhage—close the artery that is bleeding. That is not difficult under local anesthesia. We must make every effort to find out what deep artery it is and treat it as quickly as possible by what we acknowledge as the best treatment.

About depressed fractures of the skull, I do not think there can be any dispute about the necessity of raising a depressed fracture or removing the bone as the case may be. One of the great sources of epilepsy is a depressed fracture of the skull. This morning when Dr. Cheney was reading his paper I thought about the difficulty of evaluating epilepsy in the terms of preceding injury. Of course, every one with epilepsy looks back to injury as the cause, just as everyone with brain tumor looks back to injury as the cause. There is no question but that depressed fracture causes epilepsy. There is no question but that serious injuries of the brain cause epilepsy. Any serious injury of the brain is a potential source of epilepsy. If a patient is going to develop epilepsy from an injury to the head, the epilepsy will practically never start within a year, but usually within eighteen months after the injury. That does not hold for depressed fracture because the exciting agent is there constantly. It is when the lesion has adjusted itself to the scar within the brain that epilepsy comes on, a year to eighteen months after injury. Of course, one has always to look back into the patient's history. The patient will not tell you if he had attacks of epilepsy before the injury which recurred after convalescence.

There is one other fracture that I find is badly treated and that is compound fracture. What are you going to do with a compound fracture? A compound fracture should be reduced to a simple fracture at the very earliest moment because of the danger of infection. No matter how serious a patient's condition may be, shock or otherwise, that compound fracture must be reduced or at least so handled as to prevent the introduction of infection from without. If the patient's condition is good enough the wound can be closed tight without drainage. There is no reason for ever draining a wound of the head. In the first place, your chances of infection are very much less. Secondly, if infection does develop later then the wound can be opened and the infection treated just as effectively as if a drain had been left in place. A depressed fracture should be lifted just as quickly as the patient's condition will justify it, except that closure of a compound wound never should be done when the patient is in active shock.

So much for the treatment of acute injuries of the head. Unfortunately, there are many late results from these injuries that come under quite a group of different types. Of course, the one outstanding complication is post-traumatic neuroses. I shall not go into it. You are more familiar with that than I am. It is the most distressing chapter in pathology.

I shall show some slides illustrating different types of the late effects of head injuries.

CESAREAN SECTION, ITS INDICATIONS, LIMITATIONS, TYPES AND COMPLICATIONS*

GEORGE KIRBY SIMS, B. SC., M. D.
Attending Obstetrician and Gynecologist, Washington Park Community Hospital
CHICAGO

In attempting to make a fairly comprehensive research of what has been written upon the subject of Cesarean section and to present it in a somewhat abbreviated form, one is confronted with the idea that the operation is performed for almost every obstetric condition that could possibly be conceived. In fact, in many instances, we are convinced that it has been done in the absence of any particular indication. But with the opportunity afforded one for instruction in this department of medical science during the past few years, along with the facilities we now have in caring for patients in the prenatal and the postpartum periods, not only in the maternity

*Read and discussed at the Clinical Conference of the Washington Park Community Hospital, August 3, 1930.

hospitals but in the modern, general hospital of today, as well, plus the training for specialization which may be had and is obtained by men even from the smaller cities of the country, training which prepares these men definitely in the obstetric art, the indication for section should not only be more clearly defined, but more strictly adhered to.

INDICATIONS AND LIMITATIONS:

1. The *contracted pelvis* offers a large percentage of the cases for section. Of these, the flat pelvis, in which three types are generally recognized—the simple flat, the rachitic flat, and the generally contracted flat—comprises a condition which gives rise to the greatest amount of dystocia. One finds, also, the obliquely contracted pelvis, the transversely contracted pelvis, the funnel-shaped pelvis and the generally contracted or justo minor type of pelvis. These latter, however, are observed far less frequently than the flat type of pelves.

In the classification of pelvis and in the consideration of labor in the normal types one should, of necessity, exercise judgment before concluding that a fetus cannot be delivered through the birth canal, since the stature of the mother as well as the size of the baby must be considered. The factor of the fetal head overriding the symphysis pubic, as also the possibility of its moulding, may not be overlooked.

Practically all of us have been taught pelvimetry, though almost as many have at once proceeded to forget this essential part of our training. And it is quite within the bounds of propriety to suggest that the taking of these measurements is confined almost wholly to those men who are limiting their work to obstetrics.

As a very matter of fact external pelvimetry offers one little information of really definite value, but the internal measurements taken with care are fairly accurate and the estimation of the diameters is the only practical method we have in determining whether the pelvis is contracted. If the conjugata vera is 7.5 cm or less it is almost impossible for a baby of 3,100 grams, or seven pounds, to be delivered per vaginam. If this measurement lies between 7.5 cm and 9.5 cm, with strong uterine contractions, a baby of normal size may have a 50-50 chance to pass through the normal birth canal. With a conjugata vera larger than 9.5 cm the fetus has a good chance to be delivered normally provided the distance between the ischial spines is 8 cm or more. This latter diameter must never be overlooked in a primipara, because of the fact that one may be dealing with a funnel-shaped pelvis which permits the fetal head to engage, but wholly prevents its passing through the outlet.

2. *Placenta praevia* provokes a divergent opinion among the obstetricians, but with a placenta centralis, unless the child is too premature, I am of the opinion that a large majority of them will recommend a section.

3. In *certain* cases of *abruptio placentae* and *prolapse of the cord,* as well as for *neglected shoulder* and *breech presentations,* section is generally conceded to be the delivery of choice.

4. Multiparous women whose cervices reveal extensive *scar-tissue formation,* as a result of lacerations brought about during previous labors or through operative procedures in the upper vaginal tract, are subjects for section, since these keloid cervices will scarcely dilate. And the lacerations resulting from labor in such cases may extend well up into the broad ligaments, giving rise to alarming hemorrhages, infectious processes and prolonged postpartum convalescence, as well as to chronic, future invalidism.

5. In the presence of *carcinoma of the cervix* section should always be the method of delivery in order to avoid rapid, metastatic implantation of the cancer cells. A panhysterectomy, in a large majority of these cases, should follow the section. As a further means of protection to the patient radium or x-ray or both should be used.

6. *Malignancies of the bladder and rectum* offering obstruction to the pelvic outlet are absolute indications for section and the operation, as in the above instance, should be followed immediately by x-ray or radium therapy.

In primiparae, in whom a long, rigid cervix is found, one may do well to resort to cesarean section, because of the long, tedious labor which results in a large majority of these cases. This, however, may not be taken as an iron-clad rule or procedure because, only recently, the essayist has confined two primiparae, one of 43 and the other 45 years of age, whose labors were normal and without dystocia.

8. In *eclampsia* or *pre-eclamptic toxemia,* especially in elderly primiparae in whom the

cervix is long, rigid and closed, or in one whose pelvis reveals that degree of contraction which might cause the accoucher to feel that should delivery through the normal birth canal be attempted he may come to grief on account of losing both the mother and the baby, a section should certainly be done.

9. *Obstructive growths,* such as *fibromyomata uteri* and *pedicled cysts* of the ovaries which encroach upon the birth canal, especially in the most dependent part of the pelvis, in which position they become obstacles to descent and engagement, call for section with removal of the obstruction.

10. *The physical condition of the patient* is always a prime factor in the consideration of the termination of labor and this feature should be ascertained early in the gestation period in the execution of the finesse of our diagnosis and prognosis. In the face of a *poorly compensating heart* or in the presence of an *active pulmonary tuberculosis,* one should not temporize with the case, but perform a section as soon as, or even before, the patient is at term.

TYPES AND COMPLICATIONS:

1. *The Classic cesarean section,* for the sake of safety to the mother and to prevent grief on the part of the operator, as well as to educate the obstetric surgeon to a greater sense of responsibility and humanitarianism, should either not be considered or it should be limited to the absolutely clean case, since the mortality and the morbidity in this type of operative procedure are both high, as proved by hospital records. The Michael Reese Hospital reports a mortality rate of 5.5 per cent. in the classical operation as compared with 1.3 per cent. for the low cervical or laparotrachelotomy, even with both groups in the hands of trained, obstetric surgeons and done, as they were, in the excellent obstetric department of a Class A institution.

General statistics regarding the mortality rate in the classic section show an astoundingly high percentage. In several of the hospitals in the vicinity of Boston, in cities ranging from 25,000 to 40,000 population, where the work was done by general surgeons and practitioners, as revealed through the statistics gathered by Newell, the death rate is shown to have reached the staggering enormity of 20 to 30 per cent.

Adhesions as have been reported in abdominal operations which have followed the classic section, are not an infrequent occurrence; nor is it by any means unobserved that a spill of meconium, liquor amnii and blood finds its way into the peritoneal cavity creating an unnecessary rise in temperature as a result of foreign protein absorption.

One will not dispute that on account of entering the general, peritoneal cavity and having to handle the intestines, at least to some extent, that the patient cannot avoid a certain degree of *peritoneal shock, tympanites, ileus,* or *gastric dilatation,* for nature abhors a vacuum no less than the nervous organism resents the insult offered by an abdominal prowl.

The probability of *rupture of the uterus* in subsequent labors is a complication which demands serious consideration; although we do know that some women have given birth to a baby through the normal birth canal following the classic section. The fact, however, that this type of section is easier to do and may be done more speedily than the low cervical operation, should in no manner influence us to do, or even afford anyone a leeway for doing, the easier type of operation.

2. *The low cervical section or laparotrachelotomy,* as designated by J. B. De Lee has, during the past ten years gained in ascendancy with obstetric surgeons, and rightly so, because of the many factors which commend it so admirably. The *mortality and the morbidity,* as have already been pointed out, are greatly lessened. These conditions, though depend largely upon: 1, the particular type of the case, as to whether it is clean or infected; 2, the number of hours the patient has been in labor; 3, the state of the membranes, whether they are intact or ruptured, and last but not least, 4, the technical cleverness of the operator.

In a series of cases reported at the Chicago Lying-In Hospital, running well into the hundreds and extending over a period of ten or more years, vomiting has occurred in only a few instances. There has been little peritoneal shock, tympanites, ileus or gastric dilatation and, in fact, the convalescence has been more similar to that following an uncomplicated appendectomy. It has even stimulated that of an uneventful postpartum period of a normal labor.

Postoperative adhesions, except in frankly infected cases, those cases in which one would naturally anticipate such pathology, are infrequent and have been conspicuous on account of their absence, as has been reported by De Lee, Williams, Hirst, Polak, Peterson, Titus, Danforth and others who have had occasion to do a second and even a third section on individuals previously delivered in this manner.

Ruptura uteri is an almost unheard of complication in labors subsequent to the low cervical section, as has been pointed out in the literature, since only eleven authentic cases have been reported following a series of 25,000 laparothrachelotomies.

3. *The Porro Operation* is merely the removal of the uterus and adnexa subsequent to a cesarean section. The original operation which consisted simply of cutting across the cervix and the broad ligaments in the region of the internal os, ligating the stumps and attaching them to the anterior abdominal wall, thus leaving them extraperitoneally, has long since been abandoned and a technique such as that in doing an ordinary supravaginal hysterectomy is used.

The indications for the operation generally group themselves under the following heads:

1. Ruptura uteri.
2. Atony uteri, such as may sometimes occur following a section.
3. Fibromyomata uteri, either submucous or intramural.
4. Conditions of the uterus and adnexa which render it difficult or almost impossible to secure and control hemostasis.

4. *The vaginal cesarean section,* or hysterotomy, as it is now more generally referred to, is seldom resorted to in the States, but in the clinics of Continental Europe it is frequently performed in the presence of obviously infected cases, such as for which it was originally intended.

SUMMARY:

1. Accurate external and internal pelvimetry should be executed on all primiparae and records made of these measurements.

2. Finesse of detail should be exercised in the study of all primiparae that we may be more certain in our diagnoses and prognoses.

3. The classical section should be resorted to only under such conditions as those which call for a most rapid emptying of the uterus, and even then the case should be a clean one.

4. The low cervical operation or laparotrachelotomy is the section *par excellence* because of its:

(a) Safety from uterine rupture in subsequent pregnancies and labors.
(b) Adaptability for meeting and caring for infections.
(c) Freedom from adhesions.
(d) Lack of peritoneal shock, ileus, tympanites or gastric dilatation.
(e) Uneventful postpartum convalescence.

REFERENCES

1. De Lee: The Newer Methods of Cesarean Section, Ill. M. J., May, 1922, p. 341.
2. Newell: Cesarean Section, Chicago Medical Society Bulletin.
3. Hanna: Low or Cervical Cesarean Section, So. Med. J., July, 1926, p. 554.
4. Stein & Leventhal: Laparotrachelotomy, Am. J. Ob. & Gyn., August, 1929, V. XVI, p. 229.
5. Danforth & Grier: Low Cervical Cesarean Section, Am. J. Ob. & Gyn., Aug., 1929, V. XVI, p. 239.
6. De Lee: 1925 Year Book on Ob. & Gyn., pp. 159-160.
7. Beck: Cesarean Section, J. A. M. A., V. 02, No. 1, Jan. 5, 1929, p. 27.
8. Greenhill: Porro Cesarean Section, J. A. M. A., V. 90, No. 1, March 31, 1928, p. 1023.
9. Baer: From discussions of paper on Laparotrachelotomy by Stein & Leventhal.
10. Williams: Toxemias of Pregnancy & Treatment of Eclampsia, J. A. M. A., V. 88, No. 7, 2-12-1927.

2376 East Seventy-first Street.

TREATMENT OF VINCENT'S ANGINA AND STOMATITIS*

HAROLD A. ROSENBAUM, M. D.

CHICAGO

Since 1925[1,2] in Germany and France the use of stovarsol in the treatment of syphilis, especially in infants and children, has been found very valuable. Stovarsol or spirozid, as it is called in Germany, is an arsenical which can be administered by mouth, and therefore has the advantage over those which must be injected. After considerable experience with stovarsol in the treatment of syphilis it appeared that it might also be efficacious in the treatment of Vincent's angina and stomatitis, since the lesions of syphilis disappeared as rapidly with stovarsol as with the various arsenicals which are injected. With this idea in mind the coöperation of several physicians at the Children's Memorial Hospital

*Stovarsol for this study furnished by Merck and Company.

was asked. Our case reports and comments follow:

Case of Dr. J. L. Reichert:

Girl of 8 years. April 29, 1930, patient complained of sore throat, lassitude, chilly sensation.

April 30, temperature 102.6. Six to 8 shallow gray pinhead to pea size ulcers were present on the soft palate with sharply demarcated irregular borders. Mucosa of soft palate intensely injected. Smear shows many fusiform bacilli and spirilli. One-fourth tablet stovarsol to be given daily. No local treatment.

May 2. Temperature normal the past 24 hours. Appetite good. No pain in throat since afternoon of April 30 (a few hours after beginning of treatment). Ulcers are very shallow, somewhat larger, borders circinate. Smear positive for Vincent's organisms.

May 3. Faint traces of ulcers on palate. Ten to 12 pinhead shallow ulcers seen on buccal mucosa, especially opposite lower teeth. No subjective symptoms.

May 5. No ulcers seen anywhere.

May 6. Smear negative. Mucosa normal.

Case of Dr. Harold A. Rosenbaum:

Girl of 1-9/12 years. History of sore mouth beginning June 15, 1930. Patient was first seen June 18. At this time there were three small superficial ulcers near the tip of the tongue. The pharynx was inflamed and the gums beefy red, spongy, and bled easily. Fulsiform bacilli and occasional spirochetes were present in the smear of the ulcers. She was given acetyl salicylic acid two grains in orange syrup every three hours.

The patient was next seen in the evening of June 19. There was no improvement in throat, gums or tongue, and an ulcer was present on the left cheek and a swollen left submental node size of an olive. Temperature was 101. Food was taken only on forcing. One-fourth tablet of stovarsol was ordered given that evening and again the following morning and each day following:

June 21. Temperature 99. Mother reported that child took food eagerly but that the gums bled easily. The enlarged lymph node was smaller, she said.

June 22. Child eating well but gums bleed.

June 23. Child apparently well. Swollen submental node almost gone. Gums no longer bleeding and appear almost normal. Smear shows few fusiform bacilli and rarely a spirilum.

Case of Dr. J. Rhodes and Dr. A. Newcomb:

Girl of 1 6/12 years. Temperature 98. Seen May 17, 1930, with complaint sore mouth for four days. Inflamed buccal mucosa and gums swollen and red with ulcers present. Foul odor from the mouth. Tongue has a marked coating and bleeds readily. This patient was treated for two days with hydrogen peroxide locally and potassium chlorate internally.

May 19. Local condition as on previous visit. Child refuses to eat. Smears showed many fusiform bacilli and numerous spirochetes. One-fourth tablet stovarsol begun daily.

May 22. Patient eating better but still cries a good deal. Both ear drums injected. Gums greatly improved. Two ulcers still present on upper maxillary gums. Smear report: numerous fusiform bacilli and occasionally spirochetes.

May 26. Patient eating better. There is still some excoriation around the gingival margins of the lower incisors but very little redness and swelling. Smears show many fusiform bacilli and numerous spirochetes.

June 2. Gums have healed. Small ulcer at base of tongue and some redness of anterior lower incisors present. Smear: numerous fusiform bacilli but no spirochetes seen.

Case of Dr. G. Muns:

Boy of 3 1/12 years. Admitted to outpatient department of Children's Memorial Hospital April 17, 1930. Temperature 101. Gums red and ulcerated. Pharynx inflamed. Stovarsol ¼ tablet was ordered to be given daily in a tablespoonful of water or milk and child asked to return in a week.

April 24. Temperature 99. Mother stated there was relief first day of treatment as shown by willingness to take food. There were no ulcerations but the gums were still redder than normal. At this visit I saw the patient and the mother brought also the baby, a girl of 1 5/12 years. For the past two days she had been fussy, refused all solid food, and had a sore mouth. Temperature was 100.4. Ulcers were present over buccal membrane and the gums, and the gums bled easily. There was also some cervical adenopathy present. The child was ordered given ¼ tablet of stovarsol daily. The mother did not return with the child, but it was learned on inquiry that the child was progressively better the following days.

Case of Dr. A. Newcomb:

Patient age 2 8/12 years, tempt. 99, came to the outpatient department May 12, 1930, with a complaint of severe sore mouth. For two days the gums were deeply reddened, swollen, bled easily, and there were a few superficial ulcers on the tongue. The right tonsil was swollen and red. Smears showed many fusiform bacilli and spirilli. One-fourth tablet of stovarsol was given daily and on May 15 patient returned and the following note is recorded: Child feels very much better. Ulcers on tongue gone. Gums still tender and red. Tonsils reddened. The laboratory report of the smear is as follows: Numerous fusiform bacilli seen, but no spirochetes seen.

Case of Dr. Louise Kappes and Dr. D. Hutton:

Girl of 2 5/12 years. Temperature 101.8. First seen May 22, 1930. She was an exceptionally well developed and well nourished child. She was brought in because of a sore mouth of four days' duration. Many small superficial ulcers were present on and under the tongue and on the buccal mucosa and there was a dirty yellowish brown necrotic membrane on the right tonsil. The alveolar margins, particularly the upper left, were red, ulcerated, and necrotic in places. There was a foul odor from the mouth. A smear of a mouth ulcer showed occasional fusiform bacilli but no spirochetes.

Local treatment with hydrogen peroxide was ordered and ¼ tablet of stovarsol daily. When she returned on May 24th the temperature was 99. There was little apparent improvement in the local condition. The mother stated, however, that the child swallowed better after one day of treatment. She did not return with the child as requested, so a social worker was asked to make a call to find out what had happened. The call was made one week after the last visit to the outpatient department. The mother stated that the child was in the street playing and said that three days after treatment had been begun she seemed well and ate as usual. She had therefore not considered it necessary to return with her.

The above case seems to be of the type Faber[3] refers to when he says: "Often the lesions appear unchanged after one or even two days and will suddenly on the third or fourth day appear almost healed." This period he called the "latent period." "In some instances," he says, "the temperature is a better guide than the local appearance, and drops to normal within one to two days."

Case of Dr. I. M. Epstein:

April 17, 1930. Girl age 2 4/12 years. Temperature 100.4; weight 23 pounds. Sore mouth and throat for three days. Bleeding, swollen gums. Smear showed many fusiform bacilli and many spirochetes. Given ¼ tablet sovarsol.

Seen again April 24. Temperature 98, weight 24¾ pounds. Mouth well except about a carious tooth which was abscessed. Many fusiform bacilli, no spirochetes seen. The gain in weight here bears evidence of the greater intake of food.

Comment:

Although few in number, these cases seem of value because of the similarity in results. In all cases where there had been fever the temperature fell to normal in 24 hours. Perhaps the most striking feature of this treatment was the relief from pain within 24 hours or in some cases even in less time after the beginning of treatment. Eager taking of food was commented on by parents of children who previously for days had taken food or drink only after urging and force. The decrease in the number of spirochetes in smears and in some cases their disappearance following treatment is noteworthy. The fusiform bacilli did not disappear. These patients seemed to improve equally as rapidly as those treated by injections. This conclusion is reached after comparison with Faber's cases and those of Barenberg and Bloomberg[4].

Local treatment if given should be most careful, as if not carefully done it can do more harm than good. Moreover, it does not appear necessary. Gerber, quoted by Faber[3], showed in 1910 after careful study that following the "administration of arsphenamine the spirochetes in actual lesions lost their motility within 24 hours and disappeared shortly, while those on normal surfaces were unaffected." It would seem, however, that where possible bland and cleansing mouth washes, as diluted hydrogen peroxide, sodium perborate solution, etc., might well be used.

Although we have not used stovarsol in the treatment of adults with Vincent's angina, it should act well, judging from its action in children and its good results in the treatment of syphilis in adults. Cregor and Gastineau[5] used stovarsol in the treatment of syphilis in adults and compared its efficiency to that of neorsphenamine. A conservative adult dose (to be used in Vincent's angina or stomatitis) should be 1½ tablets daily. The tablets are 0.25 grams and this is true of the French and American stovarsol and the German spirozid, which, as already stated, are identical. The toxicity of this drug is evidently low, as Cregor and Gastineau gave their syphilitic patients a course which lasted four to five weeks, during which time they received an average of 15 grams of stovarsol.

Summary:

Stovarsol worked well in the treatment of stomatitis and Vincent's angina in children.

In cases with fever its use was followed by fall of temperature to normal within twenty-four hours, there was relief from pain, and the children ate again without forcing. Subjective improvement in some cases preceded objective improvement.

Stovarsol should work well in the treatment of adults with Vincent's angina or stomatitis.

REFERENCES

1. von J. Tuscherer: Zur Behandlung der Lues Congenita mit Spirozid. Monatschrift fur Kinderheilkunde, Leipzig, B. 45, Heft 1, September, 1929.

2. Dr. Paul V. Kiss: Der Heutige Stand der Peoralen Behandlung der Lues Congenita. Yahrbuch fur Kinderheilkunde, Berlin, 126-76, Heft ¾, p. 211, January, 1930.

3. Faber, H. K.: Treatment of Fusospirillary Infections of the Mouth in Children. Am. J. Dis. Child., Chicago, 1928, XXXVI, 463-69.

4. Barenberg, L. H., and Bloomberg, M. W.: Use of Sulpharaphenamin in Vincent's Angina and Stomatitis in Children. J. A. M. A., Chicago, 1924. LXXXIII, 25-27.

5. F. Cregor and F. Gastineau: Stovarsol in the Treatment of Syphilis. Archiv. of Derm. and Syphilology, Chicago, 16-43-53, January, 1927.

4753 Broadway.

INSTRUMENT FOR THE EMPTY VEIN INJECTION TREATMENT OF VARICOSE VEINS

HENRY R. KENNY, M. B., Ch. B., A. B., (T. C. Dub.)

J. MICHAEL BENEDETTO, B. S., M. D.

CHICAGO

It is agreed by most authorities that the best results from the injection of a sclerosing solution into varicose veins is obtained when the solution is injected into an empty vein. It would appear that the minimal dilution of the solution is the ideal to be sought.

An examination of all instruments thus far recommended for the injection treatment of varicose veins shows that they do permit of the injection of the solution into a vein which is empty. Most of them merely dilate the vein and thus facilitate the introduction of the needle, and the injection of the solution into an already overdistended vein, with resulting dilution of the solution. This led us to investigate the possibilities for the construction of an intrument that would permit of a simple method of injecting the solution into an empty vein. The instrument described here is the result.

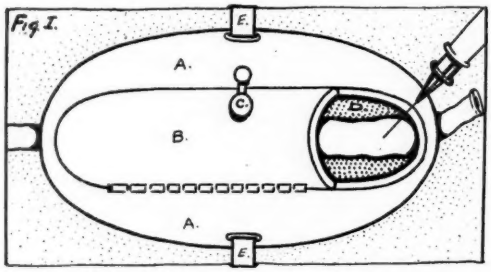

Fig. 1. Showing clamp applied in the closed position and the needle of the syringe being inserted in the dilated portion of the vein.

The instrument consists of an oval shaped slightly convex metal frame piece (A. Fig. 1) 4" long by 2½" wide and ⅛" thick, to which is attached by means of hinges a shutter B of the same thickness and contour, which when closed at C leaves an opening D. The device is incorporated in an elastic cuff E with a retaining fastener at one side.

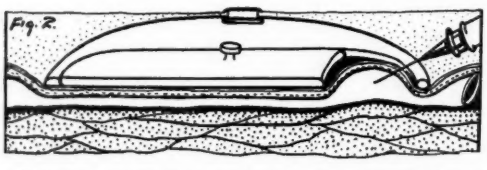

Fig. 2. Longitudinal section showing compression of the vein beneath the shutter and dilatation in the opening D.

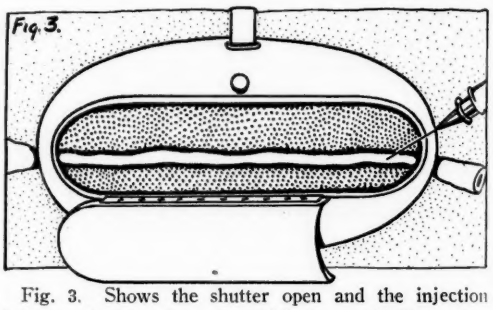

Fig. 3. Shows the shutter open and the injection being made into the vein which is practically empty.

The instrument may be applied with or without a constriction above the point of application. In some cases we find that it is preferable to apply a constriction because it causes the vein in the opening D to stand out more prominently. The instrument is applied to the leg over a vein with the shutter closed, causing the vein beneath the shutter to be compressed and the visible part in the opening D to bulge. The syringe containing the sclerosing solution is then inserted in the visible portion of the dilated vein as shown in Fig. 1; the shutter is now released and the solution is injected in the collapsed and practically empty vein (Fig. 3). The instrument may be left on for 10 or 15 minutes, holding the solution in a small part of the vein and thus preventing its dilution, or the excess solution may be withdrawn after a few minutes and pressure applied by closing the shutter on the treated vein.

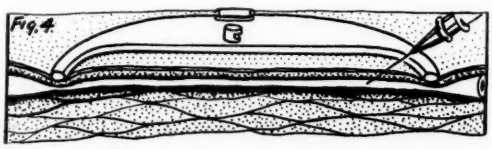

Fig. 4. Cross section with the shutter open showing the vein practically empty.

The instrument possesses the following advantages to recommend its use, namely:

1. The injection is made into a vein which is practically empty.

2. It limits the diffusion of the sclerosing solution to a small segment of vein about four inches long and hence increases the efficiency of the solution.

3. It dilates and holds a small segment of vein, preventing its being pushed aside by the needle, and it thus facilitates the easy insertion of the needle and in this manner minimizing the possibility of a perivascular injection.

4. The excess solution can be withdrawn and pressure applied on the treated vein, thus compressing it.

5. The injection may be made with the leg in either the horizontal or vertical position.

6. Solutions that are less caustic may be used because the sclerosing solution comes into direct contact with the intima of the vein.

7. One operator can give the injection without assistance.

8. Sloughing as a result of leakage is avoided because of the absence of tension in the vein.

9. The danger of embolism will be decreased because the injection is made into an empty vein.

Since we have begun the use of this instrument we have had very good results and it has proven a great help. To our knowledge no similar instrument has been described in the literature.

612 N. Michigan Blvd.

SURGERY OF PULMONARY TUBERCULOSIS*

RALPH BOERNE BETTMAN, M. D., F. A. C. S.

CHICAGO

Had the subject of "Surgery of the Chest" been assigned to me not so many years ago and my time in which to give this subject had been limited to a period of a half-hour, I could very easily have covered all the important points and some of the detail. Today I am going to limit myself entirely to surgery in connection with tuberculosis, and I can assure you in the twenty minutes allotted me I will have time only to touch some of the high spots.

Five years ago Alexander made a collection of all the cases in this country that had been operated upon for tuberculosis of the chest, and was able to collect scarcely a few hundred. This number has increased many times that amount since then.

This afternoon I am going to show you very briefly and very quickly the stages of three operations which are performed for the cure of tuberculosis of the lungs. I shall have no time whatsoever to go into the most important part of the question, namely, the picking of the case in which surgery is indicated.

Inasmuch as I have to pass over this completely, let me make one or two remarks about it. In the first place this is way and above the most important part of the subject. Such a procedure as I saw not very long ago should never be countenanced, and I am going to tell you the story just to bring out the fact.

I happened to be at a hospital out of town and while I was sitting in the x-ray room a surgeon rushed in with some films. When he saw me sitting there he said, "I am so glad you are here because we are going to do a thoracoplasty and I want to know whether you think we should start with the eleventh rib or the first rib. Here are the pictures."

I asked him where, in the past, most of the rales had been and he did not know. I finally found out that the man had come into the hospital three or four days before, and was there because he felt weak and because he had a cough. They made a diagnosis of tuberculosis in the right lung and were going into a thoracoplasty three days later.

A practice such as that is inexcusable. No case should be operated upon unless that case has been given a good trial on medical treatment first. All of the cases that I am going to show you have had from a half-year to five years' sanitarium treatment, and some longer. The idea of picking a case off the street for any of these operations should be discountenanced.

The aim of all operations in pulmonary tuberculosis is immobilization of the diseased lung. As you know, the primary factor in all medical treatment of tuberculosis is to put the patient at rest. Being able to put the patient at rest

*From the Surgical Clinics of Michael Reese and Mt. Sinai Hospital, Chicago. Published under the auspices of the Sachs grant.

Read before Section on Surgery at annual meeting of Illinois State Medical Society, Joliet, May 20, 1930.

completely allows whatever recuperative power that patient has to function to its fullest extent, and the cures we get in medical cases of tuberculosis are not due to diet and not due to fresh air, but to the patient's recuperative power which is aided and abetted by rest.

Surgery goes one step further than medicine. Not only is the whole person put at rest but the lung itself is put at rest, and I will show you moving pictures of three operations which accomplished that. The first picture I am going to show you, and the simplest one, is a procedure which is called artificial pneumothorax, the second phrenecectomy, and the third the most complicated procedure, extrapleural thoracoplasty. For completeness sake I should mention the operation of pneumolysis and that is the severance of adhesions which bind the lung to the chest wall interfering with the procedure of artificial pneumothorax, but inasmuch as this subject is still very controversial, I think it better not to dwell upon it today.

Pneumothorax. The first and simplest procedure for collapsing a lung and thereby partially immobilizing it, is the induction of a pneumothorax. Since the days of Forlanini, who conceived of the procedure, artificial pneumothorax has come into more and more general use.

In careful hands and with careful manometric control, the procedure is without danger. The technique consists of the introduction of a needle into the pleural space through an anesthesized area. The needle is connected by means of rubber hosing to a bottle filled with air. Water is gradually allowed to flow into this bottle and the air is thus forced through the tubing into the pleural cavity. The greatest safeguard in artificial pneumothorax is the manometer which is connected up with the rubber tubing in such a way that in any moment the exact reading of the intra-pleural pressure can be obtained. The amount of air allowed to flow into the chest cavity depends upon the type of case, the size of the patient, the presence or absence of adhesions, and numerous other factors. For the first pneumothorax it is wise to limit the amount of pneumothorax in an adult to less than 500 cc and certainly to discontinue while the pleural pressure is still markedly negative. A normal pleura will absorb at the rate of about 50 cc a day. Therefore in order to maintain pneumothorax the pleural cavity will have to be refilled at frequent intervals. There is an individual variation as to the desirable intervals between refills. After a case has been refilled several times and the patient's condition is very well known, it may be permissible to give large amounts of air and to bring the pressure up to positive. I personally have seen one case in whom a positive pleural pressure of over 10 centimeters of water was maintained for about six months.

Phrenicectomy. The second step in the surgical procedures for the cure of pulmonary tuberculosis, is the operation of phrenicectomy. The operation consists in cutting and evulsing the phrenic nerve. There has been a good deal of discussion as to the correct name for this operation. Phrenectomy is not correct because that would imply excision of the diaphragm. Phrenicectomy is not correct either because the entire phrenic nerve is not cut out. Phrenic exeresis is a cumbersome name and means evulsion of the phrenic nerve; it is in part true but not completely so. Inasmuch as we have no name which exactly describes the operation, I prefer the name of phrenicectomy which describes it as well as any and which is fairly simple.

The phrenic nerve is available to the surgeon during its course over the anterior scalenus muscle in the posterior triangle of the neck. Its oblique course from without inwards and downwards is just the opposite from the course of the brachial plexus and therefore makes it readily distinguishable.

The operation performed under local. An incision is made parallel to and just above the clavicle. The scalenus anticus muscle is exposed and the phrenic nerve verified as it courses from without inwards over the scalenus muscle. In order to make the identification still more certain, it can be stimulated with a galvanic current and the diaphragmatic contraction noted. The nerve is injected, cut, and the distal portion grasped and with the hemostat slowly evulsed. The purpose for evulsing the nerve is to tear the accessory phrenic nerves which join the main phrenic in the mediastinum and which carry enough motor fibres to activate the hemidiaphragm.

Phrenicectomy results in a complete paralysis

of the homolateral diaphragm. The diaphragm is sucked upwards into the chest, diminishing the thoracic cavity to the extent of about 500 cc. The paralyzed diaphragm makes no active movements during the phases of respiration. It remains either immobile or shows very slight paradoxical motion.

Thus by having paralyzed the diaphragm, we have brought about a partial collapse of the lung and moreover having partially immobilized it.

Extrapleural Thoracoplasty. The 3rd and final procedure in the surgical treatment of pulmonary tuberculosis, is the operation called extrapleural thoracoplasty. This operation collapses and immobilizes the lung permanently, by decreasing the hemi-circumference of the chest and by inadvertently producing a fusion of many or all of the ribs. The operation consists of the paravertebral sub-periosteal removal of segments of each rib from the 1st to 11th inclusive. As a result, the underlying lung becomes collapsed and due to the irregular degeneration of bone from the remaining periosteum, the chest wall becomes partially or completely immobilized. For safety sake, the operation is done in two or more stages.

The results are extremely gratifying. So far in my series, 40% of the cases operated upon have been returned to industry; 40% are either slightly improved or unimproved; and 20% have died, either shortly after the operation or within three months after the operation. When one considers that these cases were all and every one of them cases who were getting worse under the best possible medical treatment—one might say parenthetically that no case should be subjected to thoracoplasty without prolonged medical treatment—one can see how excellent the results of thoracoplasty are. Instead of 100% unimproved, we have 40% of individuals freed from the Sanitariums and back at their usual endeavors.

In spite of the magnitude of the surgical intervention, there is no noticeable deformity. This is because the shoulder girdle itself—that is the clavicle and scapula—are untouched and all clothing that the patient wears is supported from the shoulder on the side operated on as from the shoulder on the opposite side.

104 S. Michigan Ave.

THE ROCKEFELLER FOUNDATION FOR THE WELL-BEING OF MANKIND

A. R. E. WYANT, M. D.
CHICAGO

During student days at the University of Chicago it was my privilege, as football captain, to grasp the generous hand of John D. Rockefeller who has given about forty-five million dollars as the founder of our great University. If he deserved any of the criticism heaped upon him in those early days for the way he earned his millions, he now deserves still greater praise for the way he is spending his hundreds of millions.

In business enterprises Mr. Rockefeller always desired to get dividends upon his capital. He once said to a friend of mine as a guest in his home: "I have been subjected to a great deal of detracting criticism. However, I am trying to conduct my business in an honest way. But, if anybody says that I am not in business to make money, he is mistaken." His life philosophy has been: Earn all you can honestly; save all you can honestly; give all you can honestly. And in his philanthropic enterprises also he desired to get dividends, payable, not in money, but in welfare of humanity. He had always been a generous giver and as his means grew so did the problem of giving wisely. "It is easy to do harm in giving money" was Mr. Rockefeller's conclusion. The art of giving wisely was even more difficult than the art of accumulating and had to be planned and organized in the same comprehensive way. It was learned by experience that great benevolent foundations organized and directed by the ablest executives, could best help in solving the world's great problems of human need.

The Rockefeller philanthropies include the Institute for Medical Research, founded in 1901; the General Education Board, chartered in 1903; the Bureau of Social Hygiene, established by John D., Jr., in 1912; the Rockefeller Foundation, under which are grouped the International Health Board, the China Medical Board, a Division of Medical Education and a Division of Studies, established in 1913. Also the Laura Spellman Rockefeller Memorial, incorporated in 1918 "for general charitable and philanthropic purposes"; and the International Education Board, created by the younger Rockefeller in 1923. The total of these gifts aggregate the

amazing sum of more than five hundred million dollars.

The Foundation alone, during the first ten years of its existence, spent $76,800,000. Of this amount, nine million dollars was devoted by the International Health Board to campaigns against diseases. During the past five years still greater annual sums have been expended.

As a precursor of the Rockefeller Foundation, the Rockefeller Sanitary Commission was organized in 1909, for the avowed purpose of eradicating hook-worm disease in the United States. This worm malady was found to be very prevalent throughout rural districts in our Southern States. Wherever the larvae of this human intestinal parasite find conditions of soil and temperature favorable for life and development, there they flourish and there man, especially if he goes barefoot, is liable to infection by these larvae that penetrate the skin and find their way through the body into the intestinal tract, with consequent anemia, listlessness and other signs of low vitality characteristic of hook-worm infestation. It has been a tremendous curative and preventive problem and the campaign has spread all over the world and untold millions of people have been benefited. The hook-worm alone has been a major factor in health conditions among more than half the population of the earth. The Foundation has demonstrated the fact that mankind can dominate its environment instead of being dominated by it, and that the health of the people is the business of both local and national governments. Campaigns for the relief and control of hook-worm disease were carried on during the first ten years in 21 governmental areas throughout the world.

Through its various agencies the Rockefeller Foundation has co-operated chiefly in public health projects and improvements of medical education with governments and institutions in 60 countries.

With the outbreak of the World War the Foundation was one of the first American agencies to send a relief commission to Belgium and other continental countries, and later made large contributions for relief through the Red Cross and other international societies. The total sum spent by the Foundation on war work was nearly twenty-two and one-half million dollars.

The Foundation has concentrated its attention and resources mainly upon the related fields of public health and medical education.

Modern medicine is an international product. This requires communication of ideas from worker to worker and from country to country. Quite as important as the circulation of the printed page is personal intercourse between leaders of science and migration of advanced students. The Foundation has been distributing medical literature and has subsidized through the League of Nations, traveling fellowships for health officers and is helping medical scientists and practitioners of all nations to work together more effectively.

The Rockefeller Foundation has done much in holding up for attainment the highest scientific ideals in the methods, spirit and scope of modern medicine. Its aim is the discovery of new truth and its application to human need. The scope of modern medicine goes beyond getting the patient well. Its greater work is to keep the patient well by providing immunity through vaccination against many communicable diseases, by fully cooperating with the health authorities, by insisting on frequent periodical examinations to detect incipient defects or diseases, and most of all by urging conformity to the laws of personal hygiene and the seeking of positive, vigorous, abounding health.

It is to the credit of doctors that they are the leaders in preventive medicine, and are willing to suffer any economic loss resulting therefrom. The modern physician realizes that the chief purpose of medicine is to keep people well, rather than to be content to alleviate or cure diseases which might have been avoided; for modern scientific medicine has discovered the causes of many diseases and the methods of their prevention or control. The doctors of the future must not only be able to treat their patients for illness, but also to preach and practice the gospel of good health that helps to realize the ideal of a sound mind in a sound body.

The great fight against yellow fever is well known. The Walter Reed Memorial Hospital in Washington commemorates the first medical martyr who died in seeking the cause of this disease which ravaged parts of South America, Mexico, Central America and the West Indies for a period of nearly two centuries. In 1900 Dr. Reed proved conclusively that yellow fever is spread only by the infected female Stegomyia

mosquito. It was this discovery that enabled General Gorgas to drive yellow fever out of Cuba and Panama and make possible the construction of that great canal.

General Gorgas' success and advice led the Rockefeller Foundation to undertake a campaign of complete eradication of this old-time scourge. It was gradually restricted until there were only a few well-known endemic centers from which it spread from time to time. Dr. Noguchi of the Rockefeller Institute discovered the yellow fever germ and prepared a vaccine and a serum which gave promising results. General Gorgas organized national yellow fever commissions in the chief countries concerned, and he was at the head of a commission on its way to clear up a seed-bed of yellow fever in West Africa when he died in London in 1920.

Yellow fever still presents a serious problem on the African West Coast where a very virulent type is endemic and from which it may have been originally carried in slave-ships to America. The Foundation has established a station there for experimental investigation and, sad to relate, two of the greatest soldiers of science—Dr. Adrian Stokes and Noguchi—fell on this field as victims of this disease they had done so much to control.

Malaria is another mosquito-borne disease still more widely diffused and more baffling to control. It existed even in the days of the Egyptians. The decline of Greece and Rome is attributed largely to malarian fever. Only 30 years ago it was discovered that the disease is caused by the bite of an infected Anopheles mosquito. By 1910 a technique had been worked out for the prevention of malaria through drainage, screening and other methods of mosquito control and through the use of quinine. These were the methods employed by Gorgas in Panama. The Foundation has rendered unique service and co-operation with the League of Nations in this world-campaign against a scourge which has made some of the most fertile parts of the earth uninhabitable.

In the health work of the League of Nations the Rockefeller Foundation has rendered most important assistance with men and money, in some years paying from one-third to two-thirds of the entire annual budget of the League Health Organization. The Foundation has an income of nearly ten million dollars a year from its endowment for human welfare expenditure and it requires a volume of nearly 500 pages each year to report its widespread activities for "the well-being of mankind throughout the world."

CARBON MONOXIDE POISONING*

WM. D. McNALLY, A.B., M.D.
Department of Medicine, Rush Medical College
CHICAGO

Carbon monoxide is one of the most important poisons associated with human life and industry. It is out-distanced by only one other poison, grain alcohol. With the kindling of the first fire man came in contact with carbon monoxide, the most subtle of poisons. The effects of carbon monoxide were known in antiquity. Aristotle, nearly 300 years B. C., observed that "men suffer from heaviness of the head and often die from coal gas." L. Lewin,[1] in his exhaustive monograph upon carbon monoxide, gives many instances of poisoning by this agency showing that it had been a frequent cause of death by accident, by suicide and as means of punishment and torture. In 68 A. D. Seneca, after a number of attempts at suicide, finally "ended his life by breathing the vapor of burning charcoal." Hannibal (247-183 B. C.) put the inhabitants of Nuceria to death by "coal vapor." Since that time accidental deaths and suicides have been rare. Most of the deaths in recent years have been due largely to the more extended use of illuminating gas as a source of heat and power, also to the rapidly increasing use of the internal combustion engine whose exhaust always contains carbon monoxide. The number of deaths from illuminating gas have been steadily dropping in the last few years due to the more extended use of electricity as a means of illumination.

TABLE I

DEATHS DUE TO CARBON MONOXIDE POISONING IN COOK COUNTY

1917	1918	1919	1920	1921	1922	1923
470	479	518	386	237	214	261
1924	**1925**	**1926**	**1927**	**1928**	**1929**	**1930**
412	320	403	375	398	237	310

Carbon monoxide when pure is nearly insoluble in water, colorless, tasteless, and a practically odorless gas, this later physical property making it dangerous as a source of poisoning. The density compared to air is 0.967.[2] It can be com-

pressed into a liquid and a solid. It has a coefficient of solubility of 0.0243 at 15°C.

Carbon monoxide burns with a blue flame, two vols. of carbon monoxide uniting with one volume of oxygen to form two volumes of carbon monoxide.

$$CO + O = CO^2$$
$$2vol. + 1vol. = 2vol.$$

Under the ultra violet rays carbon monoxide becomes formic acid. The alkaline hydroxides change it to the formates.

$$CO + KOH = HCO_2K$$

CO unites Cl forming phosgene which was used as a toxic war gas and has also caused industrial poisonings.

Carbon monoxide is produced at the electrodes or from the charges of electric furnaces. In electric furnaces having limestone linings the carbon dioxide is reduced to carbon monoxide at the heated electrodes; the gas escapes unburned, producing characteristic symptoms. The most common sources of carbon monoxide, with the exception of its marked formation during a severe lightning storm, are stoves, grates, salamanders, domestic and industrial furnaces, distillation of oil, gas engines, fumes from explosions, burning x-ray films, smouldering ashes and mine coal, natural and artificial gases. It is formed whenever incomplete combustion of carbon occurs, such as flames on besooted surfaces and low burning oil lamps. Using an intermittent aspirator to imitate the smoking of tobacco, I found that the carbon monoxide from the inhaled smoke from cigarettes was from 0.01 to 0.26% of the tobacco and paper consumed; from cigars 0.027 to 0.15% and from pipe tobacco .027%.[3]

Enormous quantities of carbon monoxide are daily produced in the manufacture of illuminating gas, producer gas and water gas. In the city of Chicago during 1930 there were 3,724 miles of pipe used for the transportation of 110,000,000 cubic feet of gas per day, having the average composition of 8 to 9 per cent. carbon monoxide. The proportion of carbon monoxide differs greatly in domestic and industrial gases, varying between 4 and 30%; in coal gas 4 to 10%, 30% in water gas, and 20 to 30% in producer gas. The exhaust of an automobile may have from 1.5 to 16% of carbon monoxide.[4]

The greatest percentage of carbon monoxide asphyxiation is through the medium of illuminating gas, which has the characteristic odor of the hydrocarbons accompanying the gas. This familiar odor does not prevent many accidental poisonings, as the odor may not be perceived by those in deep sleep, or by a person with a defective sense of smell.

It is commonly believed that during the winter months the percentage of carbon monoxide in the illumination gas increases and that is the chief reason for more deaths from gas poisoning. The percentage of carbon monoxide does not, however, increase during the winter months. Table 2. gives the number of deaths from gas asphyxiation for each month for one year and the percentage of carbon monoxide. With the present plan of using natural gas (which does not contain carbon monoxide), mixed with coke oven gas the danger of carbon monoxide will be greatly increased unless some tracer gas is added to warn the public when it escapes. The danger of explosion is also increased with the proposed gas mixture.

TABLE 2

ASPHYXIATION IN COOK COUNTY

	Carbon Monoxide	Water Heaters	Accidental	Undetermined	Suicides	Homicides	Totals
1916	Per cent	Deaths					
Jan.	23.9	1	16	9	23	5	54
Feb.	26.4	1	13	7	13	0	34
March	24.1	0	18	7	21	0	46
April	23.9	0	19	8	19	0	36
May	27.2	2	14	8	23	0	47
June	26.2	2	11	2	12	4	31
July	23.0	0	5	12	20	4	41
Aug.	24.2	0	5	4	12	0	21
Sept.	22.4	0	13	8	26	3	50
Oct.	22.6	0	23	9	17	1	50
Nov.	29.1	0	7	5	20	0	32
Dec.	31.0	0	14	6	13	2	35

The more extended use of gas in the homes, during the winter, the closed doors and windows, preventing proper ventilation if there are leaky pipes or loose connection, accounts for the increased number of gas asphyxiations. All gas stoves, plates and heaters should be connected by metal instead of rubber.

From records of death from carbon monoxide poisonings while I was in the coroner's office of Cook County, I found 52 causes for the inhalation of the gas, the chief one of which was the open jet, next the open burner of the gas plate or range, and third the boiling water from a vessel putting out the flame.

TABLE 3

		1918	1919
1.	Open jet, cause of its being open unknown	86	133
2.	Open burner of gas plate or range	48	44
3.	Open burner of range, vessel boiling over	24	20
4.	Deceased intoxicated	19	..
5.	Disconnected hose	17	29
6.	Defective fixture	14	5
7.	Lighted gas heater	10	6
8.	Coal stove gas	8	1
9.	Hot water heater	7	11
10.	Gas heater	6	6
11.	Defective rubber hose	5	14
12.	Automobile motor running in closed garage	5	2
13.	Clothing hanging on fixture	5	..
14.	Wind blew light out	4	3
15.	Coke gas from furnace	4	3
16.	Disconnected pipe	4	2
17.	Broken supply pipe	4	1
18.	Gas frozen	4	1

Carbon monoxide may be freely respired, its presence in air not being manifested by either irritation to the air passages or by affecting the sense of smell as is noted with sulphur dioxide gas used in mechanical refrigeration. However, the moment carbon monoxide comes in contact with the blood, by diffusion, it unites with the red pigment of the blood corpuscles, forming a definite compound, carbon monoxide hemoglobin exactly replacing the oxygen volume for volume. According to the research of Nicloux[5] one volume of carbon monoxide acts like 220 volumes of oxygen. The corpuscles are not dead. All it needs is oxygen under sufficient tension to displace the carbon monoxide. Hill and Barcroft[6] have shown that carbon monoxide enters into combination more readily when a little oxygen is present than when it is completely absent. In Barcroft's[7] experiments with carbon monoxide poisoning, he found that an animal at rest could breathe an atmosphere containing a low percentage of CO and yet the hemoglobin in the spleen pulp remains perfectly free from the gas, although the blood in general circulation reaches a 20% saturation. It is evident that during this period the blood must pass from the arteries to the veins by some other route than through the pulp. During exercise, on the other hand, the hemoglobin of the pulp became charged with CO in the space of five minutes. The spleen, therefore, appears to be a place where a reserve of red blood corpuscles may be stored until some emergency arises demanding an increased oxygen transportation. Death by carbon monoxide is so common and so much has been written upon it from a toxicological standpoint that we have neglected to study and report in the literature what happens afterward in these people that survive severe or mild intoxications.

Haldane[8] believes that all the effects of carbon monoxide can be referred to lack of oxygen, the symptoms increasing with the saturation of the blood. Mice were kept alive on exposure to 200 to 300 times the fatal dose of carbon monoxide in the presence of oxygen under 1 or 2 atmospheres of pressure. Haggard[9] maintains that there is no direct toxic action of carbon monoxide on the heart, for if respiratory failure is prevented by means of administration of 8 to 10 per cent. carbon dioxide, the CO combination with the hemoglobin may rise to an unusually high percentage without any evidence of impairment of the heart function. Death in cases of carbon monoxide asphyxia is due to the failure of respiration of the nature of a fatal apnea vera. Haggard further states that the lack of oxygen resulting from the formation of CO hemoglobin induces excessive breathing which in turn results in an abnormal loss of carbon dioxide followed by failure of respiration. The increasing anoxemia from this cause speedily results in the development of heart block through its various stages.

Regardless of what may be the belief as to the nature of CO poisoning, whether CO causes only a simple asphyxia or as a toxic agent, it is well recognized that where carbon monoxide has been inhaled for a considerable time the damage done to the nervous tissue, especially the vital nerve centers, is very serious. Some observers declare that carbon monoxide exercises a specific action upon the nervous mechanism of the heart which has been attributed to its specificity for the nerve centers.

The period of time during which the presence of carbon monoxide may be detected in the blood does not depend alone upon the duration of the period of exposure or its intensity, but upon individual peculiarities as well. In most cases, however, the length of time during which CO may be detected depends largely upon the period of exposure.

The diagnosis of carbon monoxide is often very easy, sometimes difficult and never positive unless a chemical examination of the blood has been made. The symptoms may simulate many other conditions. The reason for this is chiefly in the rate of absorption and the extent of the

combination of the hemoglobin with the gas. When the volume of breathing is increased by muscular exertion the absorption of gas is proportionally increased. The smaller or younger the individual the quicker the saturation of the blood by carbon monoxide. In the resting stage the volume of breathing varies between individuals as a function of the surface area of their bodies. Small individuals succumb to carbon monoxide more rapidly than large individuals, for the volume of their respiration is greater in relation to the volume of their blood. This fact is made of practical use in the examination of the air of mines, when mice or canaries are carried into the vitiated air as living signals of dangerous amounts of gas. Men breathing the same atmosphere have about twenty times as long a stay in the contaminated air as the small animals before getting into a like condition, as men have one-twentieth the skin surface of the small animal per unit of body weight.

TABLE 4

PERCENTAGE SATURATION OF THE BLOOD WITH CARBON MONOXIDE AND CORRESPONDING PHYSIOLOGICAL EFFECTS

Per Cent. of Hemoglobin in Combination with Carbon Monoxide	Physiological Effect
10	No appreciable effect except shortness of breath on vigorous muscular exertion.
20	No appreciable effect in most cases except short wind even on moderate exertion; slight headache in some cases.
30	Decided headache; irritable; easily fatigued; judgment disturbed.
40-50	Headache, confusion, collapse and fainting on exertion.
60-70	Unconsciousness; respiratory failure and death if exposure is long continued.
80	Rapidly fatal.
Over 80	Immediately fatal.

The onset of symptoms may be sudden, but usually there are warning sensations as headache, throbbing of the temples, ringing in the ears, faintness, dizziness and vomiting. The face becomes red and there is loss of memory, vertigo, fainting, anesthesia and loss of all spontaneous power of movement. The heart action is at first violent, then weak, slow and arrested. The body temperature is lowered. Recovery is sometimes rapid. As a rule, however, there is a slow return to consciousness with more or less prolonged headache and nausea. When the gas itself does not kill, apoplexy or softening of the brain may follow.

According to Becker and Schwerin,[10] the sequelæ divide themselves into four groups: 1. Primary gangrene with blisters and decubitus. 2. Primary hemorrhages, as of the lungs, apoplexy, and the like. 3. A persistent distention of the capillaries and other vessels in which the symptoms are shown in the skin, red nose, red spots not unlike those caused by frostbite. 4. A deep-seated disturbance of the regeneration of all organs, especially of the vascular walls and the ganglion cells of the nervous system, evidenced by secondary hemorrhages, idiocy, imbecility, chorea, ascending paralysis, etc.

Evidence of injury to the lungs is noted in a number of victims of gassing who have an excess of fluid in the respiratory tract, frothing at the mouth, in the early stages and the appearances of rales in the lungs and later bronchopneumonia. The work of Hill and Semerak[11] upon the brain emphasizes the relation between carbon monoxide poisoning and the subsequent development of nervous and mental disease. From the examination of 32 brains they came to the conclusion that the damage to the lenticular nucleus depends upon the age of the patient, the degeneration of the vascular system, pre-existing disease of the brain, duration of life after the accident and the amount of gas inhaled. Briand[12] says that the loss of memory is common as a result of CO poisoning. It is not slow and progressive as in alcoholic dementia, but comes on suddenly. Oliver[13] reports blast furnace men who develop incomplete loss of power in the limbs and later an affection of speech after the acute symptoms have disappeared.

In the acute stage a diagnosis of food poisoning, strychnine poisoning, diabetes and alcoholism have been made in cases of CO poisoning. In fact, the symptoms are so varied that a physician is reminded of disease of the brain, spinal cord, lungs, kidneys, liver and skin. As many cases have persistent vomiting, a few have convulsions, some are in coma, a few have delirium, and 20% have glycosuria, a faulty diagnosis cannot always be criticized.

Chronic poisoning by carbon monoxide has received the attention of many observers in recent years. There is very good evidence of this

form. Accumulated cases show that it is the result of being in a constantly contaminated atmosphere. The symptoms are described as an alteration in the digestion, diminished vigor, gray color of the skin, coated tongue, loss of memory, diminution of the psychic powers, and occasional convulsions. The pathologic findings of autopsies have shown, in some cases, fatty degeneration; in others, pernicious anemia.

Haines, Karasek and Apfelbach,[14] in their investigations of the effects of carbon monoxide, found that workmen exposed frequently to the gas in metallurgical establishments in a large majority of cases developed a considerable increase of red corpuscles above the normal, the number in one case examined reaching 9,000,000. The amount of hemoglobin was also usually above normal. These investigators attribute the increase in red cells and hemoglobin to a protective effort on the part of the system.

Treatment. This consists in taking the person at once out of the poisonous atmosphere into fresh air, and in inducing artificial respiration as rapidly as possible; the giving of oxygen under slight pressure, enough to distend the cheeks, and compressing the lungs, is considered one of the most, if not the most efficient methods of restoring the person to life. The elimination can be hastened by the inhalation of oxygen and 5% carbon monoxide.

Postmortem. Sudden death by carbon monoxide may produce very few changes, or if the patient lives for a short time after exposure, only a careful examination of the blood will reveal the presence of the gas. Where the blood is well saturated with the gas the surface of the body is deeper red than other parts. The most characteristic change is the bright cherry red blood, usually fluid and coagulating slowly, present in the arteries, veins and all of the tissues. When death occurs rapidly from cyanid poisoning, the blood is also bright red, but the color is not as permanent as in gas poisoning. If the gas poisoning be prolonged, small hemorrhages are present in the pleural cavities, with pulmonary edema and bright red froth in the air passages. Small punctiform hemorrhages may be found in the gastric and intestinal mucosa, great omentum and in the leptomeninges under conditions difficult to explain except under carbon monoxide. As previously mentioned a very characteristic change in prolonged carbon monoxide poisoning is the occurrence of punctiform hemorrhages and softening in cortex and central nuclei of the brain, notably with two internal segments of the lenticular nucleus. Where life has been prolonged the skin may show herpes, blebs, and pemphigus, followed by gangrene. The kidneys may show fatty degeneration and necrosis in the convulated tubules.

CARBON MONOXIDE AND PRIVATE GARAGES

The number of deaths caused by inhalation of carbon monoxide from automobile exhausts in closed garages is increasing. In six years I collected 63 deaths.[15] Every day during the winter months the lay press contains reference to deaths in garages in some part of the country. As the average composition of the exhaust gas by volume is 6.03%[16] only a few minutes are required to obtain a toxic dose. Yant, Jacobs and Berger[17] give the percentages of carbon monoxide in the air of a closed garage of 2,950 cubic feet capacity in which a five passenger car was running at 200 revolutions per minute. In twenty-five minutes the air contained 1.31%, in sixty minutes, 2.10%. Public garages are more of a menace to the workers in the garages than to the public. Kranenberg[18] reported in 31 different garages that in 69.5% of the workmen who submitted to the blood test carbon monoxide was found. The concentration of carbon monoxide in the air of city streets other than automobile boulevards is insufficient to constitute a serious public health hazard. The Chicago Department of Health[19] reports: "At times the air of automobile boulevards contains enough carbon monoxide to menace the health of those exposed over a period of several hours, particularly if their activities require deep and rapid breathing." Death from carbon monoxide in private garages is absolutely preventable. If the poisonous gases from the exhaust are conducted to the outside air by means of a pipe or hose in the door to which the automobile exhaust can be attached. In the absence of this arrangement the large door of every garage should be left open so that the exhaust gases can be discharged directly into the outside air. If our patients could be educated to ventilate their homes by opening the doors and windows when they first

smell gas many of the deaths listed in Table 3 could be eliminated.

REFERENCES

*Read before the Chicago Society of Industrial Medicine and Surgery, March 4, 1931.

1. L. Lewin: Die Kohlenoxydvergiftung, Berlin, 1920, p. 8.
2. Nicloux: L'Oxyde de Carbone et L'Intoxication Oxycarbonique, 1925, p. 24-26.
3. McNally: (Peterson, Haines, and Webster, Legal Medicine and Toxicology, Volume 2, p. 297.)
4. McNally: (Peterson, Haines, and Webster, Legal Medicine and Toxicology, Volume 2, p. 298.)
5. Nicloux: Presse Med., 1916, 25, 153, Ibid, 1021, 29, 701,
6. Hill: Biochem. Jour., 1914, 7, 471.
7. Barcroft: Ibid., 481-491.
8. Haldane: "The Laws of Combination of Hemoglobin with Carbon Monoxide & Oxygen." Ibid., 1912, 13, 44, 275.
9. Haggard: Studies in Carbon Monoxide Asphyxia, 1. "The Behavior of the Heart." Am. J. Physiol., 1921, 56, 390-403.
10. Becker & Schwerin: (Peterson, Haines and Webster, Vol. 2, p. 308.
11. Hill & Semerak, J. A. M. A., 81, 644, "Changes in the Brain in Gas (Carbon Monoxide) Poisoning."
12. Briand: "Amnesie de C. O., "Ass. D'Hyg. Publ., 1889, 21, 356.
13. Oliver: Brit. M. J. , 1921, 2, 108.
14. Haines, Karasek: Report of (Ill.) Commission on Occupational Diseases, 1911, p. 89. Apfelbach, Carbon Monoxide. In Diseases of Occupation, Kober & Hanson, Phila., 1916, 43.
15. McNally: Archives of Pathology and Laboratory Medicine, January, 1928, Vol. 5, pp. 43-48.
16. Bulletin of New York Academy of Medicine, August, 1926, p. 421.
17. Yant, Jacobs & Berger: J. Indust. & Engin. Chem. 16:1047, 1924.
18. Kranenberg: Nederl. Tijdschr. v. Geneesk. 78: 1798, :79: 509, 1925.
19. Connolly, Martinek, and Aeberly: Amer. Jour. of Publ. Health, Vol. XVIII, No. 11, Nov. 1928, p. 1383.

INGUINAL HERNIA IN EARLY INFANCY WITH A REPORT OF THREE STRANGULATED INGUINAL HERNIAE OCCURRING IN NURSLINGS

AIME PAUL HEINECK, M. D.

Surgeon to the Lakeside Clinic and Post-Graduate Hospital, Francis Willard and St. Paul Hospitals

CHICAGO

Inguinal hernia is not an uncommon finding in infants. As a congenital lesion it is frequently observed in the new-born child, and as a matter of course every new-born child should be examined at the time of birth for signs of hernia.

In very young infants, strangulated inguinal herniæ are uncommon and the performance of herniotomy in these little patients is always interesting and a matter for record. I have recently treated three such cases, the particulars of which are given in the short histories that follow.

Case 1. Referred by Dr. Echerer. An infant, aged ten days, is suddenly taken sick; painful, walnut-sized, irreducible swelling in the left inguinal region; vomiting; absolute constipation; fever. Incision; hernial sac contained a moderate amount of blood-stained fluid. Following the application of compresses dipped in hot saline solution, the herniated portion of gut, which was slightly purplish, resumed its normal color and was returned to the abdominal cavity; neck of sac transfixed; sac resected; only two sutures were needed to close operative wound; recovery.

Case 2. Referred by Dr. Frances Ring. Infant, thirteen days old; a pigeon-egg sized swelling, not present at birth, suddenly appeared in the right groin twenty-four hours previous to admittance to the hospital. Swelling is tense, painful, irreducible; surrounding area shows signs of inflammation; mass did not transilluminate. Patient vomits almost continuously; vomitus offensive in odor, fecal in nature. After incision of the skin and other overlying hernial tissues, it was seen that the herniated loop of gut had a gangrenous appearance; constricting ring divided. The gut, after the application of warm compresses, resumed its viability and was returned to the abdominal cavity. Operation for radical cure. Recovery.

Case 3. Male baby, thirty-six hours old. Referred by Dr. Goldberg. Painful, tense, tender, irreducible swelling along right inguinal canal and extending into the scrotum. Child vomited once. Under ether anesthesia, the swelling was incised and it was then seen that the herniated loop of gut was strangulated at internal ring, but was freed and returned to abdominal cavity; sac resected, then sutured. Closure of abdominal wound with gut; skin approximated with Michel clips. Uneventful recovery.

Types of Inguinal Hernia. Congenital inguinal hernia may be unilateral or bilateral, intra- or extra-funicular, associated or unassociated with other developmental defects. In the intra-funicular type, the sac is found included in the fibrous sheath common to both testicle and spermatic cord. In the extra-funicular type, the sac is outside of this sheath. The intra-funicular herniæ are the more numerous and include the congenital herniæ. Inguinal herniæ are classified according to the location of the hernial sac into properitoneal, interstitial or intermuscular, bubonocele, scrotal, labial, and so forth; according to the nature of the hernial contents, into enterocele, entero-epilocele, into hernia of the urinary bladder; of the appendix vermiformis, and so forth, according to the anatomical state of the hernial contents into reducible, irreducible, inflamed, incarcerated and strangulated. Inguinal herniæ are also classified, according to the orifice of escape, into direct and indirect. Direct inguinal hernia is extremely rare in childhood. In 430 operations for inguinal hernia in

children, reported by Andrei, there were only two of the direct variety, both bilateral.[1] Coley states that there was not a single case of direct hernia in children at the Hospital for Ruptured and Crippled Children. Indirect hernia is that commonly observed.

Etiology of Congenital Inguinal Hernia. The most commonly assigned cause of inguinal hernia in infants and in young children is a persistent or non-obliterated processus vaginalis peritonei or funicular process (Nuck's canal). Its homologue in the female is a tube of peritoneum which descends from the uterus into the inguinal canal and which sometimes persists long after birth. The processus vaginalis peritonei appears about the third month of intra-uterine life.[2] Complete obliteration of this sac occurs by approximation of its walls and usually, but not in all individuals, take place at about the time of birth. Camper found 45 per cent. of bilateral persistence and 31.5 per cent. of unilateral persistence, the right side predominating. Hertzler believes that a patulous canal can be demonstrated in about 10 per cent. of all infants. There is no exact information as to what proportion of infants are born with this patulous peritoneal diverticulum.

A potential hernial sac may persist into adult life; may be present in the absence of a hernia; may exist for years without any evidence of its presence. Jaboulay and Patel cite Ramonède as having found a patulous canal in thirty-two of 215 adults from fifteen to eighty years old. In this connection it should be stated that though developmental defects do not cause herniæ, they undoubtedly predispose to hernia formation. Associated with hernia, one frequently finds one or more anatomical anomalies—an abnormally long mesentery, an imperfect development of the internal oblique muscle, an abnormally large slit in the transversalis fascia opposite the internal ring, an enlarged external ring, and so forth.

Russell,[5] in 1899, stated that all oblique inguinal herniæ in children and in adults are congenital and that they are determined by developmental variations in the anatomy of the scrotal peritoneum, such as the non- or incomplete closure of either the funicular or testicular portion of the processus vaginalis or the involvement of either of these portions between the various layers of the abdominal wall. He reiterated this opinion in 1922.[6]

Obliteration of the patent processus vaginalis begins at the external ring and one can, by careful dissection, almost always discover the fibrous remains of this peritoneal sac. As a rule, the sac is intimately associated with the tunica vaginalis and cord. Inguinal herniæ due either to the persistence of the processus vaginalis or to other preformed peritoneal pouches or diverticula are true congenital herniæ, properly so-called. Acquired herniæ differ from the preceding in that the sac is not preformed but is derived from the parietal peritoneum around the deep inguinal orifice.

The following are important contributory etiological factors: Weak musculature, such as is present in poorly nourished children; weak areas suddenly and repeatedly exposed to concentric compression by the violent contraction of all the abdominal muscles, the diaphragm and the pelvic muscles included; greater abdominal pressure than the particular wall can withstand, as may occur during straining at urination because of a tight prepuce, during paroxysms of cough, and so forth.

Statistics of Age, Sex and Site. Jaboulay and Patel tell us that inguinal herniæ form 83.2 per cent. of all herniæ in the male at all ages; they form 43 per cent. of all herniæ in females. Coley in "Keen's Surgery," Vol. 4, states that the proportion of herniated males to herniated females is 4:1. In 1038 operative cases in young children,[9] the proportion of males to females was neearly 4:1.

Macready, in investigating 17,538 inguinal herniæ in males, found that 3158 of these first appeared during the first year of life, 670 between the first and fifth years and 390 between the sixth and tenth years. Inguinal hernia appears to be about five times more frequent in the first year than during adult life.

Paterson and Gray report that in 130,243 admissions of children under three years of age to the Hospital for Sick Children, London, England, during 1919 to 1924, there were 1018 herniæ of all kinds. Of these, 773 were simple inguinal hernia. Of these 773 inguinal herniæ 696 were in males and 77 in females, a proportion of about 9:1. In Esten's[10] 101 radical operations for inguinal hernia in eighty-five young

patients under two years of age, eighty-two were males and three females. These were hospitalized cases calling for radical operation and the proportion of males to females in such circumstances is likely to be much higher than in ordinary cases.

Regarding the site of the hernia, in Paterson and Gray's 773 cases the hernia was right sided in 477 (62 per cent.), left sided in 155 (20 per cent.) and bilateral in 141 (18 per cent.). These percentages were about the same for each sex. The percentages were 64, 23 and 13, respectively, which agrees fairly well with Paterson and Gray's figures.

Inguinal hernia is more frequent in males than in females probably because of developmental differences between the true inguinal canal and Nuck's canal. To explain the great incidence of right sided hernia, it has been suggested that the right processus vaginalis closes at a slightly later date than the left.

Evolution. The opinion is expressed by many observers that almost all herniæ in infants and children close spontaneously if the intra-abdominal pressure is lessened sufficiently to keep the sac empty. The sac of a hernia may become untenanted; nevertheless, it remains a sac and in the absence of obliteration, it remains a potential site for hernia.

Uncomplicated hernia in children rarely causes death.[12] In children with hernia not operated upon, the mortality varies according to different writers from 0.3 to 1.5 per cent. In simple uncomplicated herniæ, unless the operative mortality can be kept as low as these figures, operative measures are not justified. The operation itself is not to be feared; it is the shock and such surgical accidents, as lung, intestinal and other complications, that deter the surgeon.

With careful asepsis, well understood technic and avoidance of post-operative wound contamination by urine or feces, the operation for radical cure almost always secures complete and permanent recovery. The great majority of recurrences following operations for the radical cure of hernia take place within the first six months and nearly all within the first year.

In extensive observations of infantile hernia in the Hospital for Sick Children, London, it was found that there was a spontaneous disappearance of inguinal hernia in 185 of 209 patients not operated on. The percentage of spontaneous disappearance was higher in females than in males (37 per cent. and 22 per cent., respectively[8]). Spontaneous disappearance occurs usually before the age of one year, but in some cases the hernia was found to recur up to the age of three years. Disappearance seems due, undoubtedly, to occlusion of a persistent processus vaginalis or Nuck's canal.

DIAGNOSIS

The diagnosis of true inguinal hernia even in a very young infant rarely offers any difficulty and, in general, its presence is self-evident. Usually the swelling is small and confined either to the inguinal canal or to the inguinal canal and the upper part of the scrotum. "When one finds, in the locality where hernia usually occurs, a rounded or oval tumor which gives an impulse when the child coughs, laughs heartily or cries, which is larger when the child stands and disappears or is easily pressed into the abdominal cavity when it lies down,"[13] the diagnosis of hernia is justified. If the hernial sac contain intestine, the reduction of its contents is likely to be accompanied by a gurgling sound which is pathognomonic.

Inguinal hernia must be differentiated from encysted hydrocele of the cord, from hydrocele of the tunica vaginalis, of the funicular process of Nuck's canal, and from cysts of the hydatid of Morgagni. An undescended testicle often appears in the inguinal canal and the condition may be unsuspected if the scrotum be not carefully examined. Rectal infection may be associated with enlarged inguinal lymphatic glands.

An inguinal hernial sac in an infant is sometimes translucent and in this regard not differentiable from a hydrocele. Ashurst[20] reports a case which he had diagnosed strangulated hernia. The salient symptoms were pain in the right groin, vomiting, constipation and fever. On operation, the condition was found to be a hydrocele of the cord.

Strangulated inguinal hernia is very rare in the child, as in them an incarderated hernia is usually easily reduced. Estor[14] found that in nine large European clinics no case has been observed. Wetherell[15] cites Herzfeld[16] as having observed only three cases of true strangulation in a series of 1500 consecutive operations for hernia in children. Mac Lennan found four

strangulations in 1038 herniotomies. They all recovered. In 1200 cases of inguinal hernia in children treated in the Hospital for Ruptured and Crippled, New York, Fuld[17] saw only one case of strangulation. Krause[18] considers that 10 per cent. of infantile herniæ are strangulated. Paterson and Gray found eight cases of strangulation in 1018 herniæ in children under three years old. While these figures are greatly diversified, yet they suffice to show that strangulated hernia is a rare occurrence in infancy and in early childhood. Most authors consider the rarity of strangulation in childhood explainable by the feeble resistance of the tissues which surround and form the hernial sac. Estor reported fourteen incarcerated herniæ in 101 radically operated cases at the Bonn Surgical Clinic; this must not be considered a normal proportion, as most of these children were hospitalized on account of complications, including strangulation.

Strangulation may occur at any age. Krause considers that it occurs mostly during the first six months, and 125 of 225 cases collected by Estor occurred in infants aged six months or less. Herzfeld considered that strangulation usually appeared between the sixth month and the fourth year, rarely between the sixth year and puberty.

A number of cases of operation for strangulated inguinal hernia in very young infants have been reported. In Griffith's[19] case, the patient was five days old; in Stern's[28] case, ten days; in McLaurin's[27] case, fourteen days, in Jago's[11] fourteen days; in Jopson's[20] case, two weeks; and the youngest patient in MacLennan's series of 1038 herniotomies was the same age; in Fuld's case, fourteen days; in White's[21] case, sixteen days; in Collin's[22] case, eighteen days. Collins states that the youngest patient on record was that of Woodbury[24] operated on by Andrews in 1874. The infant was only forty-five hours old. The hernia in this case was the size of the child's head; it contained the greater part of the large intestine. Gruneck[25] recently reported a case of strangulated hernia in a prematurely born child. The operation was performed without anesthesia and was successful. I find no similar case mentioned in literature, but Cardier[26] mentions a case of bilateral irreducible hernia in a child at term.

Opinions vary in regard to the relative frequency of strangulated herniæ in children compared with that of adults. Estor estimated it as 1:62; Frickhoffer[27] at 1:107; Stern and Brunier[28] at 1:108.

The symptoms of strangulation in infants parallel those of the same accident in adults: Nausea, vomiting, constipation, tenesmus, and so forth, are usually present. The cardinal symptoms peculiar to infants are violent and uncontrolled screaming, recurrent vomiting, retention of urine, and the facies peculiar to obstruction and rapid collapse.

The sac most usually contains small intestine only, occasionally the cecum and appendix. In Seaton's[8] case, the strangulated hernial sac contained a gangrenous appendix. The urinary bladder may form the inner wall of the hernial sac. Collins and Watson give small intestine as the only contents of the sac in 85 to 90 per cent. of incarcerations, respectively. Collins states that the cecum and appendix are found in the sac in about 7 to 20 per cent. In Woodbury's case, child forty-five hours old, the large intestine was in the sac. In females, the ovary, the fallopian tube or the tube and ovary, in part or in their entirety, may be the sole or part contents of the hernial sac. In eighteen of the 1038 herniotomies reported by MacLennan, vestigial rests were found in the sacs or connected with them; in one case, the hernia was bilateral and there was an adrenal gland in each sac. The vestigial remnants in fourteen of the cases were cortical adrenal tissue. Watson states that the mortality of untreated strangulated hernia varies from 37 per cent. up to twenty-four hours to 78 per cent. after seventy-two hours.

TREATMENT

Wetherell states that until the beginning of the present century, conservative measures alone were employed in the treatment of inguinal hernia of infants. The employment of the truss in hernia of young children is comparatively recent. The underlying reasons for the non-employment of truss treatment were the difficulty of fixing a truss in the case of a very young child and the fear of gangrene and eczema.

In the absence of distinct indications to the contrary, treatment by truss suffices until the child is old enough to undergo a herniotomy.

Opinions vary in regard to the most suitable age for operation.

Broca[29] orders a rubber truss and advises operation only in herniæ not kept fully reduced by this type of truss. Hertzler states that twenty-five per cent. of infants treated by a truss are temporarily cured of their hernia by it, that is to say, the searing of the truss may be discontinued after a time. Hertzler, however, thinks that there is no physiologic or adapted pathology of the peritoneum to warrant the hope that the use of a truss will cause a hernial opening to become obliterated. The truss may succeed in keeping the rupture reduced; but it causes some pressure atrophy on the compressed muscle fibers. Often trusses obscure but do not cure herniæ. "The well-known skein-truss more often hides than retains the hernia." (Hertzler.)

Coley and Bull, with an experience of 1500 cases, advocate operation in uncomplicated hernia after truss treatment of from one to two years has proved unavailing.

Watson agrees with Coley, Buford[30] and others that it is not advisable to operate before the fourth year unless it is absolutely necessary. Martin, of Paris,[31] advises waiting until the fifth or sixth year in cases of inguinal hernia where there is simple persistence of the peritoneo-vaginal canal; with the sac usually reducible, operate towards the end of the first year; when the sac is irreducible, operate in the absence of general contra-indications.

Paterson and Gray, with an experience of nearly one thousand cases in young children, state that the usual procedure in the Hospital for Sick Children, London, is to apply a rubber truss until after the age of one year, when the child can better withstand surgical and anesthetic shock.

The rubber truss is irritating to an infant, especially, as it is difficult to keep the vicinity dry. The skein wool knotted truss is satisfactory but it requires skill to make and must be changed several times each day. Rosenberg[32] has recently described a truss made of a triangular pad stuffed with absorbent cotton. To each corner of the pad there is attached a muslin tube about 15 cm. long and these are tied in the same way as the wool truss. This truss also may have to be changed a few times each day.

It was not until about the beginning of the present century that the majority of surgeons everywhere agreed to the necessity of a radical operation for hernia in the very young child. Krecke[33] thinks the fear of operating on infants and young children is entirely groundless. Infants can undergo herniotomy in their first year and the mortality in large hospital clinics is only about one per cent. Other factors being equal, select the operation that is; (a) simplest as to technic; (b) safest as to life. Rapidity of operating and careful dissecting without bruising of the tissues contribute to success.

Operative relief is indicated:

1. In all inguinal herniæ that are not fully controlled by truss-wearing because, in the presence of this condition, the hernia constantly tends to increase in volume. Hernia is aggravated by crying, straining. Even if a patent canal close spontaneously, there remains a weak spot which at any time may yield to any unusual intra-abdominal pressure.

2. In all inguinal herniæ that are difficult to reduce.

3. In all inguinal herniæ that are associated with reducible hydrocele or fluid in the hernial sac.

4. In all irreducible inguinal herniæ.

5. In all incarcerated inguinal herniæ.

6. In all strangulated herniæ, unless the patient is moribund. Do not give cathartics in strangulated herniæ. Empty the lower bowel by aid of enemas. Taxis is injudicious and may be harmful. If a strangulation has existed for some time, attempts at taxis are more dangerous than operation. Taxis is neither a simple nor an innocent procedure, as even moderate manipulation may contuse, perforate or rupture the gut wall. Taxis may lead to "reduction en bloc" or to reduction into the internal portion of a bilocular sac. Any hernia which suddenly becomes larger, irreducible, tender and tense, accompanied by local and abdominal pain, followed by nausea and vomiting, is to be considered a strangulated hernia and calls for immediate operation. Early operation saves the patient: (a) From intestinal resection; (b) from generalized peritonitis; (c) from acute toxemia. When a hernia suddenly becomes larger, irreducible, tense, tender and is accompanied by local and abdominal pain, nausea

and vomiting, there is a call for immediate operation. Delay is to be condemned.

Wetherall states that in a series of 1000 radical operations by Herzfeld in infants and young children, there was only one operative death. Early operation gives a relatively good prognosis.

MacLennan operated on 522 cases and Spitzy[23] on 230 cases with no deaths.

Stiles[34] reports 360 cases with five deaths and four recurrences and Kovacs[35] 232 cases with one death and one recurrence.

Gatti[36] found the mortality rate following operation in children under six years old was 1.45 per cent. and in the case of children from six to twelve years old, 0.71 per cent.

In Esten's series of 101 radical operations, in the Bonn Surgical Clinic, in children under two years old (the youngest fourteen days), there were only two deaths and one recurrence. Fourteen of these were incarcerated herniæ, and in seventy-five cases a Bassini operation was done. The mortality in the 225 cases collected by Estor up to 1905 was 23 per cent. but many of these were old cases and the mortality has since then been vastly improved. Most writers agree that even in strangulated cases the mortality should not exceed 10 per cent. In 1027 radical operations recently reported by Mambrini[37] for inguinal hernia, ectopic testicle and hydrocele, in which either a complete or modified Bassini operation had been done on young children, the operative mortality was only 0.84 per cent.

There were four recurrences in the series of 1038 cases reported by MacLennan and four in 564 cases reported by Paterson and Gray. The recurrence in some cases was due to the breaking of catgut sutures.

Technic. The first and essential principle underlying all operations for radical cure of hernia is the complete removal of the hernial sac. With the finger separate the peritoneum through a zone all around the internal ring so that the sac is completely isolated from the muscles for at least 1 cm. The sac is ligated or sutured at its neck, then resected. The second essential is to rectify any of the various anatomical defects that may be present and to carefully repair the musculo-aponeurotico fascial layers of the abdominal wall. There must be an adequate reinforcement of the defective abdominal wall. The use of heavy suture material does not add to the security of the operation, but rather predisposes to trouble by forming abscesses about the suture.

In many cases of simple hernia, uncomplicated hernia, radical operation will result in certain cure. It can be performed with safety. It forestalls the occurrence of strangulation. Operative injury to cord and vas is purely a technical error. High ligation of the neck of the sac without opening up the inguinal canal and suturing of the muscles will suffice. This is especially the case if a short patent canal is the only factor. In every case, note the type of sac present and the nature of the sacular contents. See if there be: (a) abnormality in the descent of the testicle; (b) any developmental rests; (c) if the urinary bladder forms the inner wall of the sac; (d) if phimosis co-exists. Phimosis should be corrected either at the time of the herniotomy or shortly thereafter. If the content of the hernial sac be an inflamed appendix, remove it. Seaston,[8] operating on an infant six weeks old, for strangulated inguinal hernia, found the hernial contents to be a completely gangrenous appendix. He removed it. Recovery.

Many surgeons, however, prefer the Bassini radical operation or some of the many modifications of it. It is well to keep in mind that speed and smoothness come from uniformity of procedure, and such uniformity should be cultivated. Select an operation which in its aim, in its method and its results is practically perfect. Muscles and fascia will unite if approximated without the intervention of loose areolar tissue. Fuld, in his patient, made a two-inch incision parallel to Poupart's ligament and about a quarter-inch above it and exposed the sac. The exposed sac was grasped with artery clamps and the infunddibular fascia which surrounded the sac was peeled off and the cord carefully separated from the sac. The sac was opened carefully to avoid injury to contents, and after reducing the contents the sac was obliterated. If the contents are discolored, hot saline compresses should be applied. Resection of the intestine is not well borne by infants.

Soresi[38] gives the details of a more elaborate technic which, to us, appears needlessly complicated. The incision is started at about 2 to 3 cms. lateral to the internal ring and carried down to it. The fibers of the internal oblique are

separated by blunt dissection at about 1 cm. above the internal ring. The peritoneum is opened and the peritoneum opening of the sac is exposed at the external ring. The sac is dissected to its neck, removed and the opening in peritoneum closed and sutured. The vas and vessels of the cord are separated and a layer of transversalis muscle and fascia are sutured to the internal oblique muscle. The suture of the transversalis fascia offers a smooth inner wall and prevents the properitoneal fat from insinuating itself forward. This strengthens the protection of the structures against hernia at the internal ring and reformation of the sac is prevented.

BIBLIOGRAPHY

1. Watson, L. F.: Hernia, 1924, p. 178, et seq.
2. Joboulay and Patel: Nouveau Traite de Chirurgie, Paris, 1908, Vol. 25, p. 145, Hernies.
3. Seaston: Brit. Jour. Surg., April, 1927.
4. Hertzler: Treatment of Inguinal Hernia in Children, J. A. M. A., 1913, 61:1879.
5. Russell, R. H.: Lancet, 1899, 2:1353.
6. Ibid: Brit. Jour. Surg., 1922, 8:502.
7. Macready, J. F.: A Treatise on Ruptures, London, 1893.
8. Seaston: Brit. Med. Journ., 1928, Vol. 2
9. MacLennan, A.: The Radical Cure of Inguinal Hernia in Children with special reference to the embryonic rests found associated with the sacs, Brit. Jour. Surg., 1921-2, 9:445.
10. Esten, J.: Ueber die erfolge der leistenbruch-operattion bei kindern bis zu zwei jahren, Deut. Zeitschr. f. Chir., 1930, 160:127.
11. Jaga, M. E. M.: A case of strangulated inguinal hernia in an infant fourteen days old, Lancet, 1928, 1:444.
12. Coley and Bull: Results of fifteen hundred operations for the radical cure of hernia in children, Med. Record, 1905, 17:401.
13. Kelley: Surgical diseases of children, New York, 1914, p. 608.
14. Estor: Montpellier Med., 1903, 16:365.
15. Wetherell, F.: New York St. Jour. Med., 1926, 26:640.
16. Herzfeld, G.: The radical cure of hernia in infants and young children, Edinburgh Med. Jour., 1923, 32:281.
17. Fuld, J. E.: Strangulated inguinal hernia in infants, New York Med. Jour., 1919, 109:233.
18. Krause, A.: Ueber eingeklemmte saüglin shernien, Beitr. z. klin. Chir., 1921.
19. Griffiths, S. J.: Brit. Jour. Surg., 1927, 14:527.
20. Jopson, J. H.: Ann. Surg., 1910, 51:131.
21. White, R. I.: Strangulated inguinal hernia in a sixteen day old infant, J. A. M. A., 1927, 89:2186.
22. Collins, A. N.: Strangulated inguinal hernia in early infancy, Ann. Surg., 1913, 57:188.
23. Spitzy: Pfaundler and Schlossmann's, Diseases of Children, 1912.
24. Woodbury: Philadelphia Med. Times, December 25, 1875.
25. Gruneck, Fred: Successful herniotomy on a premature infant, Med. Jour. and Record, 1928, 128:125.
26. Cardier, Presse Med. Belge., 1908. 60:656.
27. McLaurin, Charles: A case of strangulated inguinal hernia in an infant aged fourteen days, Lancet 1900, 1:1281.
28. Stern and Burnier: Un case de hernie inguinale étranglée et sphacelée chez un enfant de dix jours, Bull. Soc. d'Obstet., Paris, 1907, 10:283.
29. Broca: Rev. Gen. de clin. et de therap., 1924, 38:513.
30. Buford, C. G.: Surg., Gynec. & Obst., 1913, 17:632.
31. Martin, A.: Med. Jour. & Record, 1927, 126:297.
32. Rosenberg, L. C.: The treatment of inguinal herniæ in young infants, J. A. M. A., 1924, 83:686.
33. Krecke, A.: Muench. Med. Wchnschr., 1927, 74:1060.
34. Stiles, Harold J.: The operative treatment of hernia in infants and young children, 360 consecutive cases, Brit. Med. Jour., 1904, 2:812.
35. Kovacs: Arch. f. klin. Chir., 1910, 91:177.
36. Gatti: L'ernia inguinale neel'infanzia, Gologna, 1920.
37. Mambrini: Clin. Chirurg., 1927, 30:179.
38. Soresi, A. L.: Amer. Jour. Surg., 1923, 37:226.

PERNICIOUS ANEMIA AND THE EMOTIONS

HOWARD KENNETH SCATLIFF, M. D.
CHICAGO

The clinical symptom-complex we know as pernicious anemia has rapidly become less terrifying since the memorable and fairly recent work of Minot, Murphy, Koessler, Maurer and allied workers. Less terrifying in that the periods of remission of the disease are longer and under a fair degree of dietetic control.

A survey of the literature on pernicious anemia for the last ten years is most interesting because it brings out the emphasis that has been laid on the therapeutics of anemia (with complete justification as results show) but etiologically and pathologically the advance has been far less rapid and less satisfactory. Ten years ago we were just emerging from the surgical era. It had been argued and shown that the palliation which followed a splenectomy was greater than that obtained by blood transfusion. On the basis that one of the functions of the spleen is to destroy the feeble or imperfect and deteriorated red cells, the spleen was removed to stop such destruction; but the argument and the idea of toxic origin persisted with the result that one group of workers had quite a large series of cases in which not only the spleen was removed but also the appendix and gall bladder. Then these operative procedures died out and were almost entirely discontinued while in the words of one surgeon, "It seemed wise to await the verdict of time." Well, time proceedeth while our etiologic ideas are still in a state of flux.

The many theories embrace a multitude of conceptions: it has been considered a deficiency disease, either as an avitaminosis or as a chloride depletion or retention affair, a toxemia from absorption of poisonous amines, an endocrine disturbance, an infestation with protozoa, a bacterial infection with the Bacillus Colin, B. Welchii, and B. Perfringens being named, and a metabolic disturbance with an increased pres-

ence of unsaturated fatty acids. And thus it is quite evident that the problem is most complicated and a great deal more information must be acquired before we can have a satisfactory conception of the disease and the disturbed physiologic processes it produces while developing. It is with these thoughts in mind as a possible justification that the writer ventures to outline the following cases. As a stroke of good fortune both of these individuals had been under observation previous to the onset of the present condition which permits therefore, a comparative value to be placed on the etiologic factors elicited.

The first case is that of a white male, 42 years of age, whose chief complaint is that of weakness and a diarrhea which is almost continuous; frequent attacks of nausea and vomiting and no appetite which he attributes to a feeling of fullness in the epigastrium. These symptoms date back to an episode four months previous at which time he was held up, threatened with a revolver, hit over the head with the same, kicked and beaten generally. This occurred during the course of his regular employment as a bank messenger while he was delivering a payroll and was attended with much fright. He thinks that his extreme fear and consequent inability to follow orders was misinterpreted by the bandits for resistance and the physical manhandling was a consequence. At this time he was put to bed for several days and it was during this confinement that he experienced his first attack of nausea and vomiting and later diarrhea. At the time of his admittance to the Hospital and examination, he is pale with a peculiar color of the skin suggesting a low-grade jaundice. The sclerae are yellowish and the mucosa is pale. His tongue is fissured and the surrounding areas appear raw. He volunteers the information that he cannot eat tomatoes, pineapples or much salty food, "It hurts my tongue." *Teeth*—Upper incisors bridged in (lost from trauma. Some pyorrhea around the lower incisors. *Heart*—Systolic murmur at the base, loud venous hum in the neck. *Lungs*—Normal. *Abdomen*—Liver palpable; spleen not palpable. *Urine*—Light in color, no albumin, no sugar, no casts. Temperature 99°F. Pulse 84. Respiration 26. His finger nails are pale and he says his hands go to sleep frequently and he has a tingling sensation in the fingers. *Blood examination*—Coagulation is normal but the capillary bleeding time is prolonged. Leucocytes 6,000; erythrocytes 3,150,000; hemoglobin 55%. Anisocytosis +. Poikilocytosis ++++. No platelets. Occasional nucleated red cells present. Examination of the *Stool*—is negative for blood and parasites. This man was put on a diet approximating 1,000 calories containing 120 gms. of liver with orders to increase to 1,200 calories and 180 gms. of liver in 72 hours. Now it is interesting to note that this man had an acute appendicitis just nine months previous to these findings and had, during his stay in the hospital, three blood examinations with no suspicion of the present trouble being excited. His white count before operation was 19,000. No red cell count was made. In the two succeeding examinations a more thorough report was had with no abnormal findings. The patient went home in twelve days and his recovery was complete and uneventful. His next three blood examinations—during his present term in the hospital—are at 72 hour intervals after the diet is established and are as follows: W. C., 5,500; R. C., 2,900,000; Hg., 45%; poikilocytes and anisocytosis, ++; next W. C., 5,800; R. C., 3,060,000; Hg., 47%; and next W. C., 6,200; R. C., 3,304,000; Hg., 50% with poikilocytosis, anisocytosis and polychromatophilia marked. At this point he was given 500 c. c. of blood from a professional donor and the observation continued. After the transfusion his condition improved quite readily so that we were enabled to increase the diet to 2,000 calories and 220 grammes of liver. After one month of hospital care and observation he was sent home, and after 10 weeks his blood report was satisfactory. The poikilocytosis and anisocytosis had disappeared, and with it the disagreeable symptoms which sent him in for observation.

The next patient is a woman who had been under active treatment two years ago and presented a typical case of pernicious anemia at that time. She had been placed on an appropriate diet, warned of its importance and was under observation at monthly intervals. Now upon presenting herself she looks and acts and feels very much worse. She is 58 years of age, 5 feet 5 inches tall and weighs about 165 pounds. She appears quite pale and has a suggestion of icteurs on the sclerae and mucous surfaces. Her blood report now is Hg., 50%; R. C., 1,110,000; W. C., 2,120; Color index, 2.2; anisocytosis, 4 plus; poikilocytosis, 4 plus; polychromatophilia, about 2%; macrocytes, 3 plus; small lymphocytes, 48%; large lymphocytes, 2%; and polymorphonuclears, 50%. A month previous her blood report had been R. C., 4,350,000; W. C., 9,000; Hg., 74%; color index, .86; no anisocytosis, poikilocytosis or polychromatiphilia noted; polymorphonuclear leucocytes, 59%; small lymphocytes, 35%; large lymphocytes, 4%; eosinophiles and basophiles, each 1%. Upon being queried as to her progress she reports, "Well, I had been getting along just fine until I got a terrible scare." Further inquiry reveals that she had been out walking with an old lady friend and upon coming to a street intersection had paused to look for automobiles before crossing. Seeing none, they started to cross whereupon an unseen machine whipped around the corner knocking her companion down and startling this patient into collapse. Although unhurt she had to be carried to the walk and later assisted home. Immediately following this, her diarrhea returned and with it the numbness in her hands and feet and overshadowing all, an overwhelming weakness. Under these circumstances she was admitted to the hospital, continuous bed rest instituted and a very rigid check-up of the diet begun. There was no blood nor parasites in the stool. Radio-

graphic examination of the gastrointestinal tract was negative for gall-bladder pathology and neoplasms but an achylia gastrica was found again as was the case during her previous admission to the hospital. After close observation for fifteen days with frequent blood examinations and with the most earnest cooperation of the dietitian at Ravenswood Hospital her blood picture had declined to 23% of hemoglobin and only 800,000 R. C. At this point it seemed unwise to put off transfusion longer and so she was given 500 c. c. by the Scannell method. Following this the blood films improve readily and the clinical symptoms abate. Four weeks after transfusion her blood report is hemoglobin, 74% Sahli; R. C., 4,680,000; W. C., 8,000. Erythrocytes, color—slight achromia and occasional poikilocytes. Now, four months after leaving the hospital her blood report is hemoglobin 78%; W. C., 10,000; R. C., 4,446,000; no poikilocytes and no anisocytes. Her condition is improving steadily and she is adhering closely to her diet. In this connection my thanks go out to the dietetics department for their help in educating this patient to a proper dietetic viewpoint.

Conclusion. Both of these cases present a similarity in certain phases which might lead one to suspect that there are "types" of pernicious anemia that are related in their onset and course and subsequent response to treatment. We are accustomed to seeing one patient come in with his chief complaint being glossitis, another a persistent diarrhea and yet in another weakness and parasthesiae would be the most prominent characteristics.

Again, we must consider the element of emotional disturbance. Fright, grief and violent onslaughts directed toward either the sympathetic or cerebrospinal nervous systems are prominent etiological factors. And finally the relative place of transfusion, liver diet, and intensive hydrochloric acid treatments. It has been argued that the death rate from pernicious anemia has not been reduced, that frequent transfusions leave the patient with a lack of resistance which might hurry on the next acute period of aggravation. It would seem but wise to retain all of these measures which have proven their worth to even the most casual observer. There seems to be no contraindication to the continuous use of small amounts of hydrochloric acid by the liver fed patient with a transfusion in the background should a crisis arise. It would seem in the two cases cited that the blood transfusions gave impetus to a more rapid regeneration; it seemed to act as a stimulus to proper blood regeneration.

MANAGEMENT OF THE DIABETIC*

CLARENCE J. McMULLEN, M. D.
Attending Physician Cook County Hospital
CHICAGO

It is my purpose tonight to review the present status of the management of the diabetic and discuss some of the practical aspects. Since the discovery of insulin the diet has been gradually adjusted to utilize this new therapeutic agent in the manner of most assistance to the diabetic patient. As we have become more familiar with this new hormone, we have become better able to judge its values and its limitations. The cause of diabetes is not known. It is due to a deficiency in the secretion of the pancreas, but we do not know the cause of this deficiency. Overfeeding, with lack of exercise, undoubtedly predisposes. Infections probably play a part in many cases. The disease is apparently on the increase and one wonders whether our modern mode of living, with the large consumption of refined cane sugar is not a factor. It is said that in India the natives consume large quantities of raw sugar and that there is practically no diabetes, while among the more prosperous classes in the same country who use refined cane sugar there is a high incidence of diabetes.

Insulin constitutes a replacement hormone, just as thyroid does in myxedema. Prior to the use of insulin the diet had to conform to the patient's limited ability to burn sugar, and it, therefore, contained very small amounts of carbohydrate and was as limited in caloric value as was consistent with life, especially in the severe cases. For this reason these individuals were thin and weak and favorable soil for bacterial invasions—resulting in fatal pneumonias, pulmonary tuberculosis and septicemias. With the proper use of insulin the diabetic may now have a diet approaching the normal individuals' and have better resistance to infection. In the pre-insulin days diet of C 40, P 70, F 140, low total caloric values, were absolutely necessary in the severe diabetic. This type of diet has been replaced by diet containing C values of 100 to 150 grams, and many diabeticians allow C values as high as 250 grams. This increased C value allows a corresponding reduction in the fat

*Address Before the North Shore Branch Chicago Medical Society, March, 1931.

values, giving diets such as C 150, P 60, F 110, in which the C equals or exceeds the F. These lower fat diets are more desirable, for several reasons, first, acidosis is less frequent; second, lipemia is less common, and Joslin believes that the almost inevitable arteriosclerosis of the diabetic is probably due to this high fat content of the older diets; and third, the higher C diets are more palpatable and there is less difficulty in keeping the patient on his diet. Strict, unpalatable diets may be tolerated for a time, but the diabetic has to diet the remainder of his life and sooner or later is sure to violate the high fat diets. Especially is this true of children and those engaged in hard manual labor requiring a lot of energy. There is, however, considerable personal variation in this matter and each diabetic becomes a rule unto himself, some accepting this monotonous diet with no apparent discomfort.

To properly manage a diabetic patient, it is essential that we understand certain fundamental facts regarding metabolism in the diabetic. Glucose is a substance which is readily broken down and oxidized with the liberation of heat and energy. The glucose is obtained from the C, P and F of the diet, or by the breaking down of body tissues as occurs in the severe unmanaged diabetic with great weight loss, or in the milder diabetic under certain conditions, as infections, injuries or operations. This glucose is stored in the liver and muscles as glycogen and is burned as needed, especially for muscular effort, and to a much less degree for mental effort. Fat only burns in the flame of the glucose, and when the glucose flame is low or not burning, as occurs in the severe unmanaged diabetic, the fat is *incompletely* oxidized and beta-hydroxy butyric acid, acetone and diacetic acid are produced. As long as elimination keeps pace with the formation of these acid substances a simple toxemia results, but when production exceeds elimination acetone bodies accumulate producing coma. These acid bodies are spoken of as ketones, and the glucose, because of its ability to burn and destroy these substances, is called an anti-ketogenic substance. The diabetic is unable to properly store and burn his glucose, which accumulates in his blood and by dilution with large quantities of water is eliminated through the kidneys with resulting polyuria. Insulin, in some unknown manner, restores this glucose flame. Our principal task is to see that the diabetic has sufficient glucose flame at all times, especially during the period of acidosis is it essential that we know how to give insulin and glucose to rekindle the flame.

In discussing the management of the diabetic we must consider first, the care of the ordinary uncomplicated case of diabetes. Second, care of the complicated case with acidosis, infection or arteriosclerosis. It is not possible to consider all of these tonight, so I shall discuss the problems in planning the diet in the uncomplicated case and the management of acidosis.

Hospitalization is, in most cases, absolutely necessary. If free from acidosis the diet is then planned. The caloric need is estimated on the basis of the size of the individual, 30 calories per kilogram body weight being sufficient for the average individual doing light or sedentary work. Very active individuals, or those engaged in laborious occupations, may require 35 to 40 calories per kilogram. Begin with 30 calories per kilo, and subsequently, if the patient fails to retain his usual weight or is extremely hungry the diet may be increased. While this rule of 30 calories per kilo applies to the majority it is interesting to note that some patients require much less than their estimated need. These individual variations necessitate careful weekly observation for some time after leaving the hospital, so that the calories and diet may be changed if needed. A very satisfactory plan consists of two diets for the first few days, a low caloric diet of about 1200 to 1300 calories, which allows more rapid elimination of the sugar, and then the diet is changed to the diet upon which the patient is to be discharged, with 30 calories per kilo.

The first diet of 1200 calories should contain about 80 grams of C, a low quota of P, about 40 to 50, and fat about 70 grams. In a few days on such a diet the amount of daily urinary sugar can be determined, and one gains an idea as to the severity of the diabetes. Insulin may be started at once, especially if the urinary sugar output is great. Start with small doses of three to five units before each meal, and increase the dose until the urine is practically sugar free. Then step the diet up to the final diet upon which you intend to discharge the patient. This final diet should contain from 100 to 150 grams

of C, P 60, F q. s. to make enough calories to supply the patient's needs as estimated on a basis of 30 calories per kilo. The insulin dosage is then increased to control the urinary sugar. If the dosage of insulin required is 50 units, or less, it may be divided into two doses of 30 and 20, and given about twenty minutes before breakfast and supper. Higher doses than this had best be given t. i. d. before meals, a slightly larger dose being given before breakfast. The urine is then collected in individual specimens obtained from mealtime to mealtime. If these specimens contain sugar the dose of insulin may be increased before the corresponding meal.

The proteid of the diet is the amount just adequate to replace that destroyed in daily body metabolism. This has been estimated to be three-quarters to one gram per kilo body weight for adults. Children require two to three times as much as adults to allow for growth. In our experience 60 grams serves as a very satisfactory portion as it allows the building of a diet containing an adequate quantity of meat.

On such a regime we can handle the ordinary diabetic. If the patient will not take insulin, it is then necessary to use the older type of diet with a low C of 60 or 70, P 50 or 60, and fat to make up the caloric need. This type of diet will keep the patient sugar free, but in my experience, does not supply the patient with the same feeling of well being and energy as the higher C diet.

One of the difficulties encountered by the doctor in general practice is the selection of the food comprising the diet. In the hospital the dietitian assumes this task, but when the patient leaves the hospital and returns for advice, it is often necessary to increase or decrease the diet, or perhaps make changes to suit his individual appetite. Dr. Joslin has greatly simplified this matter by arranging a series of diets containing increasing amounts of C, P and F. These diets may be used as they are, or, by a little simple arithmetic it is possible to add or subtract C or F, as desired. You will notice that these diets are arranged with the carbohydrate content increasing about ten to twelve grams in each diet, beginning with a low C of 84 up to C 158. If it is desirable to keep the insulin dosage down you may use one of the lower carbohydrate diets and add fat in the form of butter, oil or cream to make up the needed calories. However, this high fat diet is less desirable for, with the increase of the fat of the diet, the insulin seems to be less efficient. With the higher C diets containing a low fat content, where the C equals or exceeds the F, each unit of insulin accounts for more glucose and, therefore, the increase in the dose of insulin is not as great as might be anticipated.

I think that it is our duty to encourage the diabetic to take insulin and use a diet with a liberal portion of accurately weighed carbohydrates in the form of bread, fruit, potato and cereals. It makes a healthier, happier patient than the one on the old high fat regime. In some of the clinics much higher C values are advised, for example, a 2200 calory diet with C 227, P 65 and F 115. Such extremely high C diets require higher insulin dosage and intelligence and co-operation on the part of the patient to avoid insulin reactions. For this reason it is better with most patients to use C values of 100 to 150, which allows a palatable diet with a relatively low fat intake, and does not require excessive doses of insulin.

As an example of the advantages and disadvantages of the very high carbohydrate diets such as C 250, I might cite the case of a student attending the diabetic clinic of the Cook County Hospital, who for a period of approximately one yeear was on a diet of C 65, P 60, F 160. He never returned to the clinic without complaints such as headache, malaise, fatigue and lack of energy. This complaint was so constant that we began to consider him a neurasthenic. His diet was changed to a high C with C 250, and low fat value. He became an entirely different individual, full of energy, and stated that he felt much better and that all his former symptoms had disappeared. His insulin dosage was, of necessity, increased, but not in proportion to the increase in the C of the diet, for, with the low fat value the insulin is apparently able to handle a much larger amount of carbohydrate. This same youth, however, took his usual noon dose of insulin and ate a hurried light lunch, with the result that he had a severe reaction in the afternoon, with complete loss of consciousness, which came on so quickly that he did not have time to take any sugar, illustrating nicely one of the dangers of the high C diet and high insulin

dosage. On the whole, the carbohydrate 100 to 150 diet is very palatable, allows a relatively low fat intake, does not require excessive doses of insulin, and is a very satisfactory diet.

Insulin reactions can usually be recognized by the patient early enough that he may take sugar and relieve the symptoms. Atypical reactions often occur very suddenly, with loss of consciousness or mental confusion, and the patient may not be able to take the necessary carbohydrate.

Acidosis. If one fully appreciates the disorder of metabolism underlying diabetic acidosis, the management becomes more simple. The proteid and fat burn in the flame of the glucose. In diabetic acidosis this flame is low or almost extinct. It is our problem to keep this glucose flame burning, and this is done by the use of adequate doses of insulin. Acidosis is inducted by any condition which causes this glucose flame to become lowereed or extinct, among which are discontinuance of insulin, infections, as ordinary colds, bronchitis, pneumonia, hand or foot infections, operations, injuries, vomiting or fevers. To re-establish this glucose flame, we give the patient from 120 to 140 grams of glucose per day in the form of glucose solution intravenously or per mouth, or some simple carbohydrate solution, as orange juice or milk. We then give sufficient doses of insulin, first at three-hour intervals and later at six-hour intervals, to reduce the urinary output of sugar to a mere trace. If the patient takes 120 grams of glucose in the form of milk 210 cc. every three hours, or 100 cc. of one-half milk and cream, and puts out a mere trace of sugar, we know that there is an adequate glucose flame, and the acidosis will improve. In severe acid intoxication the acetone and diacetic acid may be eradicated from the blood and the blood sugar reduced to normal, but permanent damage from the circulating toxins of the cell protoplasms may prevent recovery. The usual routine in deep coma is to give approximately 50 units of insulin every six hours, or 25 units every three hours until improvement occurs, with glucose per mouth or intra-venously with each dose of insulin. In the mild cases of acidosis without deep coma ten or twenty units every six hours may be sufficient. The most important point practically is to examine the urine every three to six hours, and if the urinary sugar remains high, increase your insulin dosage until the urinary sugar is reduced to a mere trace. As long as a small amount of sugar is present in the urine there is no danger of hypoglycemic reaction. As soon as the acidosis disappears, the patient's own insulin supply returns and the dose of insulin must be decreased to avoid insulin reaction. The early symptoms of acidosis are nausea, dyspnea and weakness and should be recognized and the urine examined for acetone and diacetic acid. As soon as there is evidence of acidosis immediate acidosis management should be started, for in twelve hours a mild diabetic may be in deep coma. Every hour is important.

As soon as the patient's appetite returns he is placed on a three meal mixed diet, containing an adequate amount of carbohydrate and a relatively low fat content, as represented by C 100 P 60, and F 100, and given sufficient insulin before each meal to keep the urine sugar free.

Other important points in the management of deep coma are gastric lavage, external heat and fluids, preferably hypodermically, one to two thousand cc per day. There are cases of coma in which the laboratory findings of acidosis disappear, but the patient remains weak, semi-stuporous and dies. In our experience these patients have had complicating diseases, especially the infections, pnumonia, lung abscesses, otitis media, acute pancreatitis, septicemia or uremia. The uncomplicated coma, unless in extremis, should make a good response. Another unusual and very fatal complication of diabetic coma is urinary suppression. In this condition the urinary output becomes very small and the diacetic acid may disappear from the urine due to the inability of the kidney to excrete it. Albuminuria is usually present in these cases. Infections of any type are dangerous to even the mild diabetic. In the presence of an acute infection, every diabetic should be put on acidosis management, with liquid diet of milk or orange juice, and given insulin at six-hour intervals, with urinary examinations every six hours to keep the urine low in sugar and free from diacetic acid. All diabetics should be warned as to this danger and advised in such emergencies to follow the milk diet, cut the insulin dose in two, and to call the physician at once.

In reviewing a group of histories of diabetic coma cases that entered the Cook County Hos-

pital during the last nine months certain facts were noted. The coma was precipitated by infections in the majority of cases. A few cases were due to discontinuing insulin, and one to a gastro-intestinal upset. The coma cases with infections in the younger individuals recovered, but the older patients with infections all died, in spite of the fact that the acidosis was controlled at least as far as the laboratory findings were concerned. The fatal infections encountered were cellulitis of the neck, infectious gangrene of the leg, abscess of the chest wall, abscess of the perineum, hand infections and orbital cellulitis. There was a great variation in the insulin dosage in the cases which recovered, for example, the total first day dosage varied from 80 to 300 units, without one case of hypoglycemic reaction. These cases suggest that any diabetic coma with infection is always grave and warrants a guarded prognosis. Also that large doses of insulin are well tolerated during deep coma. When one considered that the blood sugar in the coma cases is usually 400 or more we can understand that there is little danger of hypoglycemia, and in the severe comas the 50 unit dose may be given every two or three hours for the first six or eight hours if needed. The only hope of recovery depends upon adequate insulin dosage early.

Arteriosclerotic complications are especially common in the older diabetics. Angina pectoris and coronary thrombosis may occur. Insulin, of course, cannot remove these advanced cardiovascular changes. Gangrene of the lower extremities offers one of the interesting and difficult problems in the old diabetic and here it is more a problem of arteriosclerosis than diabetes and careful co-operation between the surgeon and internist is necessary to guide these patients through their dangers.

In conclusion:

1. A theoretical knowledge of the importance of the glucose flame is essential for proper management of the diabetic.

2. The older high fat diets are being replaced by the higher carbohydrate diets, of which C 100 to 150 seems a very satisfactory value.

3. With the lowering of the fat and increase of the carbohydrate in the diet the patients feel much better.

4. The early symptoms of acidosis should be recognized promptly and adequate insulin therapy started. The uncomplicated comas respond well to insulin. The comas with infections offer a gloomier prognosis, especially in the older patients.

30 N. Michigan Ave.

THE COUNTY TUBERCULOSIS SANATORIUM—CITY LOCATED*

CECIL M. JACK, M. D., F. A. C. P. and
D. O. N. LINDBERG, M. D.
DECATUR, ILL.

In nearly all countries, sanatoria have their location in the remotest sections of the districts served. One of us[1] in 1927 reported upon the apparent success of a city located county tuberculosis sanatorium. With the lapse of several years since the earlier report there has developed an increasing amount of evidence in support of the soundness of the project with respect to its city location.

While we readily acknowledge one or two disadvantages in the plan, the obvious advantages so completely offset them as to nullify their importance. As disadvantages, we include:

(a) Smoky atmospheric conditions are present for portions of a considerable number of days in the year.

(b) Greater accessibility of the sanatorium results in increased patient visitation.

Among important advantages are:

(a) The sanatorium better serves as a nucleus for tuberculosis propaganda.

(b) The physicians of the community become more "tuberculosis minded" and interest themselves in a disease that has in the past received little attention or study on the part of the general practitioner, and it is to him we must look for major assistance in solving the problem of tuberculosis.

(c) There becomes a noticeable lessening of phthisiophobia.

(d) There are provided more adequate facilities for clinic study of contacts. (In the light of our present knowledge of diagnostic criteria of childhood tuberculosis, clinics held without routine use of roentgenograms yield inaccurate as well as misleading results.)

(e) The necessity, upon the part of the sanatorium staff to steer from the course of routine

*Read before the Illinois State Tuberculosis Association's annual meeting at Jacksonville, Illinois, November 7, 1930.

regime and to remain alert for every progress being made in their particular field.

Because of the city location of the Macon County Tuberculosis Sanitorium it seemed natural to bring about an affiliation with the adjacent general hospital[2] to avoid the necessity of making certain capital investments when the sanatorium was in its embryonic stages of growth. This affiliation was in the nature of purchasing services on the "pro-rata" basis of general hospital costs. This was, of course, based upon the theory that a large institution could, with very nearly the same overhead, provide hospital service to a smaller unit of a few additional beds at less cost than when the smaller institution provided for a separate overhead organization. At the outset, in this connection, one rather loses sight of the fact that general hospital organization has to be a complex one with a resulting per diem cost of from $4.50 to $10.00 per patient, based upon room location, number of vacant beds at a constant overhead cost, whereas a sanatorium of 75—100 beds operating independently with a more or less skeleton type of organization can furnish a very high standard of sanatorium regime for the tuberculous at an average daily cost of $3.00 to $3.25. Actual cost figures for the past seven years corroborate this, and it was partly upon the basis of costs that a reorganization program was undertaken this year.[3]

In the institutional field today we recognize two types of tuberculous wards; the first, the curative wards of the sanatorium regime; second, the hospitalization program for the advanced consumptive, hospitalized for either domiciliary or isolation reasons, or both. An administrative problem therein arises. The first group should have the less costly sanatorium regime directed by a full-time phthisiologist having mature experience in this type of institutional care and supervision. Happily the phthisiophobia of the general hospital is disappearing and the second group is easily adaptable to general hospital routine, and so today we have in large cities general hospital tuberculosis wards. The medical practitioner comes into contact with tuberculosis much closer at hand through this program of general hospitalization of certain types of the tuberculous and too much cannot be said concerning the tremendous assistance thus given in the eradication of this disease.

We believe that it is a mark of progress to bring tuberculosis sanatoria closer to civilization and the advantages have already been outlined. From the administrative standpoint, however, we feel that the control and direction of the sanatorium logically lies with those who, in addition to being institutionally trained, are well schooled in the problem at hand—sanatorium regime for the curably tuberculous. There are comforts and details and incidents of sanatorium regime that receive little notice from the general hospital executive. Certain small economies must not be practiced at the sacrifice of the contentment, comfort and morale of the patient body in sanatoria, while at the same time we are not warranted in supplying the more costly hospital service to the tuberculous patient.

We have found that actual economy results when a small but efficient chest x-ray suite is provided at the sanatorium, which also eliminates the journey to an adjoining institution with resultant loss of time to personnel and maximum expenditure of energy on the part of the patient.

Food is a factor second only in importance in the treatment of the tuberculous, to rest. The so-called "house diet" of the general hospital does not lend itself well, in our experience, to adaptation to the tuberculous who are resident in a sanatorium bed for from 1 to 3 or more years and to whom any diet becomes monotonous early in their institutional episode. There results both financial and physical loss when the diet is but partially suitable to the tuberculous patient.

The other services depend to some extent upon cost and character of those services rendered and are not within the province of this paper.

Conclusions:

1. The Macon County experiment of locating a tuberculosis sanatorium in the city has proven eminently successful over a period of seven years.

2. In the case of a county with insufficient funds to provide for capital investment for such units as power plant, etc., location near a general hospital is feasible provided that:

(a) Certain essential factors of tuberculosis treatment, such as x-ray and food, are provided at the sanatorium.

(b) Administrative control and direction rests with those responsible for the control of the tuberculosis problem.

3. The educational and propaganda features

are enhanced by a city located sanatorium arrangement.

REFERENCES

1. Dr. Cecil M. Jack: "The County Tuberculosis Sanatorium as a Unit of a General Hospital."
2. Decatur and Macon County Hospital, a privately incorporated general hospital receiving no county support or direction.
3. The Macon County Tuberculosis Sanatorium was reorganized upon a separate basis, June 1, 1930.

DISCUSSION

Dr. R. G. Bell, Champaign: Dr. Jack's paper was a very excellent one and I feel that when we go to tuberculosis meetings we spend too much time on the diagnosis and treatment of the disease and forget all about the mechanics. I am very much interested in it because it brings out what is my idea of a sanatorium connected with a general hospital. The only basis upon which a sanatorium should be connected, directed and managed as one institution is on the financial basis. I do not know of a general hospital which can be operated on $2.75 and $2.50 a day and accomplish what a sanatorium does for its patients.

Recently we have had another argument put up; that is the increased need for x-ray work, and surgery. As far as x-ray is concerned it can be done in a sanatorium and much more satisfactorily. The operating room can be put into a sanatorium which can do the work. It means that some of the equipment will have to lie idle, but, for instance, when I want surgery done I have to take my patient to a general hospital for thorocoplasty, the patient is out from under my care and management and does not get the same care, while if we had our own operating room we could have the whole thing done in our own sanatorium, especially in a sanatorium of 75 beds.

My idea is to keep the sanatorium separate. Tuberculosis is a specialty work. A dietitian has enough trouble to get a cook to prepare one diet in the proper way, much less two. General hospital food is all right for a short period of time but the diet does not vary enough to make sufficient change for a tuberculosis patient who is hospitalized for 3 to 8 months. When you go over the menu in a general hospital for a week or two I do not believe that any tuberculous patient would stand for it. Therefore, you have to get the cook to cook two sets of food. Every superintendent of a general hospital has enough to do without going into the specialty of tuberculosis and he is either more interested in the sanatorium or the activities of the general hospital. You have to rely upon your tuberculosis nurses to do a large share of the work. From the executive standpoint I cannot see the connection at all. There is no justification for it. There is too much specialty in the care of the tuberculous. I do not have any objections to locating a sanatorium near a general hospital because of the shortage of money so as to get laboratory service, and if necessary, x-ray, but do not take the sanatorium out of the hands of the man to whom it belongs, the tuberculosis executive.

Dr. Palmer, Springfield: I think Dr. Jack gives the impression which he does not intend to be given, because the Decatur and Macon County Hospital and the Decatur Sanatorium are ideally located and not in the business district of the city, but at the outskirts of the city with a country environment for the care of those chronically sick with tuberculosis. City location is not good for the tuberculosis sanatorium for the care of the tuberculous patient.

Dr. D. D. Monroe, Edwardsville: The place for a tuberculosis hospital in connection with a general hospital is for the purpose of the physicians becoming interested in tuberculosis. There are physicians who will not come to the sanatorium because they are afraid of tuberculosis. At the New Orleans meeting there was a general complaint of vacant hospital beds, and at that meeting I suggested that they set aside some of those beds for tuberculous patients. The physicians do not like it at all if we combine the two. Vermilion county has it in mind, and I think it is a fine idea.

SPONTANEOUS AMPUTATION OF THE TONGUE

Louis Schultz, M. D.
From The West Suburban Hospital, Oak Park, Illinois
CHICAGO

My inability to find similar cases cited in recent or current literature has furnished the incentive for this report.

The early history of medicine contains records of gangrene of the tongue with total loss. Such cases are reported by Hippocrates, Celsius, Galen and others, showing a rather frequent termination resembling my case. From then on the literature seems silent until the beginning of the twentieth century. Bozo of Paris in 1903 reports a number of cases in his doctorate thesis; one, a case of epithelioma of the floor of the mouth, invading the tongue. After eight months' duration it forced the tongue out of the mouth so it hung down over the right side of the lower jaw which, though the patient was edentulous, was gradually cutting off the protruding part. The amputation was completed surgically and the patient died six days after the operation. In another case of epithelioma there was spontaneous separation of the anterior portion due to the agency of the teeth. Cancer, mistaken for syphilis, destroyed the entire tongue in another case. Sphacelus destroyed the entire organ in yet another. Patient survived and could talk fairly well, but could not swallow solids and liquids except when lying down. In an interesting case of gangrene of the tongue in

a child 2½ years old two-thirds of the tongue had been lost when the child died. And finally the tongue of a probable syphilitic underwent spontaneous separation of its anterior third due to gangrene. In all these cases there appears an element which partly, but only partly, fits the picture of the case I am about to report; in that they have as causative factors necrosis, malignant disease, and syphilis.

Briefly, the etiology of spontaneous amputation of the tongue may include the following groups mentioned by Bozo: First, cases of macroglossia with a resulting protrusion and slow compression by the teeth or by the alveolar ridges, inducing a secondary ulcerative process. Second, grave primary lesions of the tongue, such as acute and chronic glossitides, including gangrene, epithelioma, etc., of the organ.

To the cases mentioned by Bozo, I want to add my own. Patient, F. G. A., male, fifty years of age, was referred to me by Dr. A. Roble on March 14, 1928. He appeared in good health, had no sign of cachexia, but has had leukoplakia on the right side of the tongue for years. He is a smoker. Past history: Father died of apoplexy at 74 years, mother living and well, 72 years old; no brothers nor sisters. Except for frequent herpes lingualis past history is negative. Nine years ago was laid up several months after having a "stroke," but returned to his work as accountant. He complained of a painful tongue of about a week's duration. It showed two areas, each about the size of a nickel, about the middle of the right dorsum. These areas were thick, hard and white. No fissures and no ulceration but an abscess in the substance of the posterior one from the center of which pus exuded. The entire right side was tense, indurated and afflicted with leukoplakia, but with the exception of the spots just described, the keratosis appeared thin, pliable, bluish-gray. There was defective speech due to the induration and swelling of the tongue. A Wassermann showed 4 plus, coupled with a history of a specific lesion twenty-five years ago; so I returned the patient to Dr. A. Roble for anti-luetic treatment. When, a month later, he returned for further observation as requested, he seemed much improved, but had developed another abscess in the mass which was incised and drained by Dr. A. Roble. Suspecting a malignancy engrafted upon the luetic lesion, I made a biopsy which showed (Dr. E. C. Piette) marked thickening of the epithelial layers, diffuse lymphoid infiltration of subepithelial structures with a widespread destruction of muscle fibres of the tongue. In other words, it was the picture of a far advanced leukoplakia, but no malignancy was found. He improved slowly, but a month later he had another small abscess, which was drained. About a year after I had first seen him he presented with a similar lesion on the left side involving the floor of the mouth. I asked for another Wassermann, but the patient drifted away. He was seen by various men. Finally he got into the hands of Dr. Allison L. Burdick, who has attended him since March, 1929, and who makes the following report: Patient visited several clinics and dispensaries receiving varying types of specific treatment, including x-ray. Tongue at this time was two to three times normal size, with a deep ulcer in the median raphe and another one at right angles to it, branching off to the left. He had a severe stomatitis, including pressure sores on the under surface of the tongue, due to his remaining teeth. Tongue was immobile. He had constant headaches, numbness of the extremities, and walked with a stumbling gait. Eye reflexes were normal. Knee jerks active, Babinski positive. Blood pressure 150/90. Urinalysis showed a trace of albumin and many hyaline and granular casts.

The condition of the mouth and tongue improved gradually over a period of six weeks when rather suddenly the tongue became so greatly swollen that it forced the mouth open until there was a gap of 2 cm. between the teeth. There was edema and swelling of the lips and chin at the same time. Again there was gradual recession in size, but the ulcer areas had definitely deepened and extended. The horizontal ulcer was now extending past the midline to the right. They bled easily. Further x-ray treatments were refused.

In September, 1929, the tongue had become small enough to be moved slightly but was extremely painful. The condition of the mouth, and the odor, were exceedingly foul. The lower jaw had swollen and the chin began to form pustular swellings. In October a crater-like ulcer with pouting edges developed on the right side of the chin, following the opening of a large pustule. The tongue continued getting progressively smaller and more movable, but interfered frequently with the act of swallowing.

On November 30, while trying to eat, the tongue got in the way. By a little tug the patient pulled out what was left of the organ. There was practically no bleeding and I was not even notified until the next morning. The specimen was oval in shape and slightly nodular, measuring about 3x3.5 cm. The laboratory report on the microscopic findings (Dr. E. C. Piette) was inflammatory infiltration, cancer pearls, and necrotic tissue, with the diagnosis of squamous celled carcinoma.

Examination of the mouth showed no tongue tissue left. The patient could talk and be rather easily understood, but had more difficulty in swallowing than before. This coincides with the case described by Bozo and mentioned above.

Subsequent history includes a marked loss of weight due largely to his inability to eat a sufficient amount of food, three very severe hemorrhages from a cleft in the floor of the mouth, the further extension of the carcinoma to the jaw and chin and the removal of two pieces of sequestrum through the gums. In fact there has been a massive extension of the ulcerous area on the chin, an involvement of both tonsils and the entire floor of the mouth including both submaxillary glands.

These glands have been palpable only since last December.

He died May 1, 1930.

25 E. Washington Street.

Society Proceedings

COOK COUNTY

CHICAGO SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY

Meeting April 1, 1931

Bacteriophage Therapy in Pyogenic Infections.... ..... F. W. Slobe

Discussion: E. C. Holmblad and V. S. Cheney.

Synovectomy of the Knee Joint in Certain Forms of Arthritis (Illustrated by Motion Pictures and Lantern Slides) ..... M. A. Bernstein

Discussion: W. R. Cubbins and E. B. Fowler.

CHICAGO MEDICAL SOCIETY

Regular Meeting, April 15, 1931

"Analgesia in the First Stage of Labor with Special Reference to Oral Use of Sodium Amytal"..... ..... Eloise Parsons

"Scarlet Fever Immunity and Streptococci Puerperal Infection".....G. E. Hudson

"Abruptio Placentae" ..... M. Edward Davis

"Intracranial Injuries to the Fetus"....Fred L. Adair

"Breech Extraction. Resuscitation of an Asphyxiated Infant"—Moving Pictures....Joseph B. DeLee

CHICAGO MEDICAL SOCIETY

Joint Meeting With Chicago Roentgen Society, April 22, 1931

(1) Affections of the Upper Respiratory Tract
H. K. Pancoast,
University of Pennsylvania,
Philadelphia, Pa.

(2) Foreign Bodies in the Air Passages, Both Opaque and Non-Opaque.
Willis F. Manges,
Jefferson Medical College,
Philadelphia, Pa.

LEE COUNTY

The Lee County Medical Society held one of the largest meetings of its history last evening at the Dixon State hospital which was attended by over 250 guests. When Dr. Warren G. Murray invited the association to hold their meeting at the state hospital the officers quickly grasped the opportunity, for other county medical societies do not have such an institution nor such an opportunity to draw visiting doctors. Seven hundred invitations were sent out to all the doctors in northern Illinois and the dentists of Dixon, the high school officials, the Dixon Nurses Alumni, the nurses of the state hospital and the pupil nurses because the program arranged was one that would be of interest to all. A number of friends of the officials were also invited to attend.

Some of the doctors came early in the afternoon to visit this interesting institution and were conducted through it by staff members. In the evening the guests were assembled in the auditorium where an entertainment was provided while the banquet preparations were being completed. Jack Watters, the chef at the state hospital, planned, prepared and directed the serving of an elaborate banquet, without doubt, the finest that the doctors have attended for a long time. There were so many acceptances received that preparations were made to feed about three hundred but the inclement weather prevented some who intended to come from Peoria, Moline, and Rock Island from attending. However, there were large delegations from Rockford, Freeport, Rochelle, Ottawa, Streator and other cities as far as Fulton. The banquet was served by twenty of the young lady attendants in a most efficient manner and was terminated by boxes of candy presented to each of the ladies and cigars and cigarettes to the gentlemen.

During the banquet the guests wer entertained by violin solos by Miss Ruby Shippee, who has recently won the state championship for violin playing and her accompanist, Loala Quick, both of Ashton, and by some charming vocal solos by Helen Parker, daughter of Dr. W. R. Parker, president of the Lee County Medical Society. She was accompanied by Clinton Ives, son of Dr. C. H. Ives, past president of the society and Frank Gorham. These solos were enthusiastically applauded by the audience.

Immediately following the banquet Mrs. Marian Hart presented several groups of her hospital pupils in various song recitals. The work that she has been able to do with these children, who were considered subnormal, is remarkable indeed. Dr. Warren G. Murray introduced his first speaker, Dr. Gladys Dick, calling attention to the fact that her work in the prevention of scarlet fever places her in the same class with such immortal discoverers as Pasteur, Jenner and others. She gave a very interesting talk on the "Practical Results in the Control of Scarlet Fever" and stated that in institutions such as the Dixon state hospital where the patients have been properly vaccinated with five doses of scarlet fever toxin anti-toxin there have been no cases of scarlet fever at all.

Dr. Paul L. Schroeder, Illinois state criminologist and director of the Institute for Juvenile Research, gave a very interesting talk on "Juvenile Behavior" calling attention to the mistakes made by parents in correcting children which may result in abnormal mental processes later. His remarks concerned many easily overlooked psychological factors in the control of children. Dr. W. G. Murray then introduced several of his staff members, the first of whom was Dr. H. E. Marselus, assistant superintendent, who talked upon "Post Encephalitic Syndromes" and illustrated his remarks by some very interesting patients. Dr. Ivan Radeff talked upon "Infantile Cerebral Palsies" and presented a number of patients. This is a type of patient whose condi-

tion is the result, usually, of some trauma during birth. Dr. B. D. Hart talked upon "Arsenical Multiple Neuritis" and illustrated a case that is rapidly recovering from this serious disease. Dr. Z. M. Glattor talked upon "Muscular Dystrophies" and presented three boys from the same family which were a most interesting group of cases. Two of the boys were placed upon a table to illustrate the difficult and almost impossible attempts to regain an upright position due to this rare and peculiar disease.

During the meeting the guests were informed of the illness of one of the best loved doctors in this part of Illinois, Dr. E. S. Murphy, and the secretary was directed to express the regrets of the many doctors and nurses present and to assure him again of their hopes for his speedy recovery.

The meeting adjourned at 11 p. m. by a rising vote of thanks to Dr. Warren G. Murray and his staff for their kindness in extending an invitation to hold this wonderful meeting at the state hospital.

MERCER COUNTY

At the Annual Spring Meeting of Mercer County Medical Society, held at Oak View Country Club, April 14, Dr. Hugh D. Stites of Aledo was elected president.

Approximately 50 physicians and their wives were present, including several from Rock Island, Knox and Warren counties.

Other officers elected for the coming year were: Dr. C. M. Murrell, Sherrard, vice president; Dr. G. L. Rathbun, New Windsor, secretary-treasurer, and Drs. V. A. McClanahan, Aledo; Hugh Stites, Aledo and W. A. Miller, Aledo, members of the board of censors.

Dr. V. A. McClanahan was elected delegate to the 81st annual meeting of the Illinois State Medical Society to be held in East St. Louis, May 5, 6 and 7, and Dr. R. G. Bird was selected as alternate. Other routine matters were taken up at the business meeting.

Two addresses of unusual interest featured the meeting. Dr. William H. Holmes, associate professor of medicine at the Northwestern University, spoke on "Nephritis" and Dr. Paul B. Magnuson, associate professor of surgery at Northwestern University, gave an illustrated lecture on "Making Success Out of Failure in Certain Common Fractures by Simple Procedures." The latter talk was illustrated by lantern slides shown by two high school students.

Tuesday's meeting was one of the most successful in the history of the local society, members agreed. Retiring officers are: Dr. T. D. Coe, Keithsburg, president; Dr. G. H. Moore, Aledo, vice president; and Dr. J. W. Wallace, of the board of censors. Dr. Rathbun was re-elected secretary-treasurer and Drs. Stites and McClanahan will remain on the board of censors.

Marriages

THOMAS DYER ALLEN, Evanston, Ill., to Ruth Delzell Mather of Kalamazoo, Mich., February 24.

Personals

Dr. Dean Lewis, Baltimore, among others, addressed the Chicago Surgical Society, April 3, on "Congenital Arteriovenous Communications."

Dr. Thomas C. Galloway, Jr., Evanston, Ill., address the Chicago Laryngological and Otological Society, April 6, on "Treatment of Carcinoma of the Esophagus."

Dr. Paul A. Isherwood, West Chicago, addressed the DuPage County Medical Society recently in Glen Ellyn on "Relations of the Coroner and Physician."

Dr. Walter S. Swan, a resident of Harrisburg since 1881, celebrated his fifty-fourth year in the practice of medicine March 10.

Dr. William F. Burres, Urbana, was recently made a life member of the Champaign County Medical Society, of which he has been a member since 1884. At present he is the only life member.

The Mercer County Medical Society was addressed at Aledo, April 14, by Drs. William H. Holmes and Paul B. Magnuson, Chicago, on nephritis and common fractures, respectively.

Dr. Edwin P. Sloan, Bloomington, addressed the Douglas County Medical Society recently on "Hospital Organization, Formation of Staff and Medical Ethics."

Iopax in the diagnosis of renal tuberculosis was the subject of Dr. Royal W. Dunham, Ottawa, Ill., among others, before the Chicago Tuberculosis Society April 9.

Dr. Karl A. Menninger, Topeka, Kan., addressed the Peoria City Medical Society, April 7, on "Suicide—A Psychological and Psychiatric Problem."

Dr. Charles H. Miller gave the final lecture in a series of health programs sponsored by the Englewood Y. M. C. A., April 2. His subject was "Outwitting Middle Age."

Dr. William D. Chapman, President of the Illinois State Medical Society, talked on "Medical Organization" before the Sangamon County Medical Society, Springfield, on April 2. Dr. Harold N. Camp, Secretary, addressed the same group on "Medical Economics."

The inaugural address of the Mayo Lectureship in Surgery at Northwestern University Medical School was given April 22 at the

Murphy Memorial by Dr. E. Starr Judd of the Mayo Foundation on "Fundamental Problems Associated with Disease of the Biliary Tract."

Drs. James H. Hutton and R. K. Packard addressed the Kane County Medical Society meeting in Aurora, April 15.

Dr. Clayton J. Lundy presented a paper on "The Electro-Cardiograph: Its Value to the General Practitioner," at the April 15 meeting of Will-Grundy County Medical Society.

Drs. Walter H. Nadler and G. K. Fenn were scheduled to give a scientific program at the spring meeting of Bureau County Medical Society, Princeton, April 16.

Drs. William R. Cubbins and Marshall Davison addressed the Jackson County Medical Society at Carbondale, April 16.

Dr. Mary E. Pogue addressed the Woodstock Woman's Club on April 13. Subject, "Psychiatry."

Dr. Emmet Keating addressed the Fort Wayne, Indiana, Medical Society, April 21, on "The Complete Physical Examination."

Drs. LeRoy H. Sloan and James H. Hutton were invited to present the scientific program at the April 21 meeting of the Fulton County Medical Society.

Dr. Carl A. Hedblom gave an address on "Diagnosis of Pulmonary Tuberculosis" at the April 22 meeting of Will-Grundy County Medical Society.

Drs. Francis S. Senear and J. G. Carr addressed the Clinton County, Iowa, Medical Society on April 23.

Drs. Geza deTakats and George deTarnowsky read papers on "Injection Treatment of Varicose Veins" and "Low Back Pain" before the Iroquois County Medical Society, April 23.

Dr. W. F. Peterson, President of the American Society of Experimental Pathology, attended the meeting of the Federation of American Societies for Experimental Biology held at Montreal, April 8-11, and presented two papers before the Division of Pathology.

Dr. Max Biesenthal, member of the Board of Directors, Chicago Tuberculosis Institute, was the guest speaker at the annual meeting of the Illinois Tuberculosis Association held in Waukegan, April 23.

Dr. Gilbert FitzPatrick addressed the Will-Grundy County Medical Society April 8.

Dr. Benjamin Goldberg will speak on "Medical Education in Tuberculosis" at the Twenty-seventh Annual Meeting of the National Tuberculosis Association to be held in Syracuse, New York, from May 11 to 15, 1931.

Dr. Clement L. Martin presented a paper on "Treatment of Hemorrhoids by Non-Surgical and Operative Methods," at the April 9 meeting of Kankakee County Medical Society.

Dr. Charles Morgan McKenna presented a paper on "Surgery of the Kidney" at the April 14 meeting of Rock Island County Medical Society.

Dr. Charles Davison, Professor of Surgery, Emeritus, of the University of Illinois College of Medicine, will deliver an address at the Medical Historical Club at the Quine Library on May 6 at 1:00 p. m. His subject will be Reminiscences," and will be devoted chiefly to the medical history of the west side of Chicago.

Dr. Max Thorek of Chicago has been made an Honorary Corresponding Member of the Egyptian Medical Association, Cairo, Egypt.

Dr. Fred Meixner delivered the Pi Sigma Phi Lecture before the faculty of Bradley College, Peoria, Illinois, on March 16. The subject was "Modern Aspects of Health Education."

News Notes

—The Chicago Medical Society announces that two weeks of post-graduate clinics will be held under its auspices at the Cook County Hospital, June 22-July 3. Physicians who are interested are requested to communicate with the secretary of the Society, 185 North Wabash Avenue, Chicago, for further information.

—Governor Emmerson has designated the week of April 26 to May 2 as Health Promotion Week. The Educational Committee of the Illinois State Medical Society will co-operate with the medical societies and lay groups in observing these dates.

—A tumor clinic has been established at Mercy Hospital for the study and treatment of malignant diseases. The clinic is equipped with facilities for diagnosis, short wave x-ray apparatus and a radium laboratory. At present it meets twice a week, Tuesday and Friday, at 10:30 a. m Every case referred to the clinic will be carefully followed in order to obtain statistical material

on end-results and to determine the best methods of treatment.

—Senate Bill 278, to amend the law concerning the registration of births and deaths, proposes that in county seats of over 100,000, local registrars of vital statistics shall not be required to file with the county clerk copies of certificates of births, stillbirths and deaths, but shall make, file, index and permanently preserve in their own respective offices a complete and accurate copy of each birth, stillbirth and death certificate registered by them.

—Through the efforts of Chief Justice John P. McGoorty of the Criminal Court, it is reported, a new advisory behavior clinic has been established in the county jail for the purpose of aiding the judges in disposing of cases in which the mentality of the defendant is at issue. It is said to be the first clinic of its kind established in a jail. Dr. Harry R. Hoffman, assistant clinical professor of neurology at Rush Medical College, was appointed head of the clinic April 1.

—An all-day clinical meeting was held by the Adams County Medical Society at Quincy, April 13, the morning program consisting of a skin clinic by Dr. John R. Pollock; a paper on otitis media and its complications, Dr. Walter D. Stevenson; presentation of cases of hyperthyroidism, Dr. Warren F. Pearce, and patients and case reports on perforated gastric ulcer, Dr. Arthur H. Bitter. In the afternoon, Dr. Edmund B. Montgomery presented "Results of Whitman's Method of Treating Fractures at the Neck of the Femur"; Dr. Thomas J. Merar, "Coronary Occlusion"; Dr. Harold Swanberg, "Preradium Treatment of Carcinoma of the Cervix," and Dr. Frank Cohen, "Early Diagnosis of Pregnancy by Animal Injection."

—The Chicago Council of Medical Women held their regular monthly meeting at the Medical and Dental Arts Club May 1, 1931, with the following program: "Study in Normal Maternity," Ida M. Alexander, M. D., State of Michigan Department of Health; "Wisconsin Maternal Mortality Study," Charlotte Calvert, M. D., State of Wisconsin Department of Health; Discussion, Bertha Van Hoosen, M. D.; Effie G. Davis, M. D., and Eloise Parsons, M. D.

—The Central Interurban Clinical Club, which is comprised of representative internists from the University of Minnesota, Mayo Clinic, University of Iowa, Washington University, University of St. Louis, Rush Medical School, University of Chicago, Northwestern University, and the University of Wisconsin and Illinois, meets twice a year and spends a day in the various teaching centers in order to become acquainted with new teaching methods and new investigative advances. They will meet May 2, 1931, in the morning at the University of Illinois College of Medicine, 1817 Polk Street, and in the afternoon at Northwestern University.

—Dr. Maud E. Abbott of McGill University spoke to the Medico-Historical Club of the College of Medicine, University of Illinois on April 8. The subject of the address was Sir William Osler, Biographical Outline and Personal Recollections, and was illustrated with numerous slides. The famous Osler museum of McGill was developed under the supervision of Dr. Abbott. Dean Davis called attention to the exhibit of Oslerana in the library. This exhibit includes the books written by Osler, the books that Osler particularly admired, the first edition of Cushing's life of Osler, with an autographed photograph of Cushing; numerous photographs of Sir William, also many letters from Sir William, some of them to various members of the faculty. The exhibit of Oslerana will remain in the library during the month of April and visitors are invited to see it any day between the hours of nine and five.

—At a meeting of the Lee County Medical Society on Tuesday evening, February 17, 1931, an election of officers was held with the following results: Dr. W. R. Parker, president; Dr. H. M. Edward, vice-president; Dr. Kenyon B. Segner, secretary-treasurer.

—The 1931 Gehrmann Lectures will be given by Dr. Alice Hamilton of Harvard University on "Recent Advances in Industrial Toxicology." The specific titles and dates are: Tuesday, May 12, 4 p. m., "Lead Poisoning"; Wednesday, May 13, 1 p. m., "Arsenical Poisoning—Mercurialism Silicosis"; Thursday, May 14, 4 p. m., "Poisoning from Volatile Solvents." These lectures will be given in the Quine Library, 1817 Polk Street. Adolph Gehrmann was Professor of Bacteriology and Hygiene from 1894 to 1918, and died in 1920. The lectureship was endowed by his

family and the lectures are given each year on some phase of Hygiene and Public Health.

Deaths

NIMROD B. ALLEN, Kankakee, Ill.; College of Physicians and Surgeons, Keokuk, 1878; formerly on the staff of Kankakee State Hospital; died, March 13, at West Palm Beach, Florida.

WALTER CLARENCE BLEY, Beardstown, Ill.; Jefferson Medical College of Philadelphia, 1900; a Fellow, A. M. A.; president of the board of education; aged 54; died, March 15, in Our Savior's Hospital, Jacksonville, of uremia, chronic interstitial nephritis and erysipelas.

JAMES CHARLES BRYDGES, Chicago; Rush Medical College, 1892; formerly on the staff of Soldiers and Sailors Home at Quincy and later with Chicago Department of Health; a practitioner for several years in California; aged 72; died, February 19, of chronic nephritis.

WILLIAM EDWARD CONSTANT, St. Charles, Ill.; General Medical College, Chicago, 1883; retired several years; aged 77; died, March 17.

EDWARD W. FENITY, Kane, Ill.; Northwestern University Medical School, 1885; member of Illinois State Medical Society; whose practice combined with that of his father, Dr. Peter Fenity, is said to have covered a period of 87 years; aged 70; died, March 29.

ARTHUR LEOPOLD FORSTER, Winnetka, Ill.; University of Illinois Medical School, 1907; author of a work, "Mastery of Cancer"; aged 47; died, April 12, of myocarditis.

HUDSON MCBAIN GILLIS, Woodriver, Ill.; St. Louis College of Physicians and Surgeons, 1907; a Fellow, A. M. A.; aged 50; died, March 22, of coronary thrombosis.

HENRY C. HOLTON, Sidell, Ill.; Jefferson Medical College of Philadelphia, 1883; a Fellow, A. M. A.; aged 77; died, March 5, in the Barnes Hospital, St. Louis, as the result of a fall.

PAUL HULLHORST, Topeka, Kans.; State University of Iowa College of Homeopathic Medicine, 1889; formerly lecturer on materia medica in his alma mater; later a practitioner in Chicago for several years; aged 64; died, February 5, of myocarditis.

MINNIE JAHP, Chicago; Chicago Medical School, 1916; aged 50; died at Elgin, December 9, 1930, of chronic myocarditis.

JOHN ALBERT KENNEDY, Modesto, Ill.; St. Louis University School of Medicine, 1907; aged 49; died, March 11, of heart disease.

ROBERT BOOTH KIRKPATRICK, Peoria, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1876; aged 75; died suddenly February 26, of heart disease.

LOUIS JACOB LINDER, East St. Louis, Ill.; American Medical College, St. Louis, 1898; a Fellow, A. M. A.; aged 55; on the staff of St. Mary's Hospital, where he died, February 27, of diabetes mellitus.

J. T. MAGILL, Erie, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1892; aged 69; died, March 10, of general peritonitis and carcinoma of the stomach.

HUGH LORIMER MARSHALL, Stronghurst, Ill.; Barnes Medical College, St. Louis, 1889; captain in the Medical Corps at Camp Meade during the World War; health physician of Stronghurst and coroner of Henderson county; member of Illinois State Medical Society; aged 58; died, March 2.

CLARENCE NICHOLAS MCCUMBER, Lewistown, Ill.; Rush Medical College, 1905; aged 50; died, March 25, in the Methodist Hospital, Peoria.

LEWIS C. MORGAN, Mount Vernon, Ill.; Hospital Medical College of Evansville, Ind., 1886; member of the Illinois State Medical Society; at one time mayor of Mount Vernon; formerly bank president; aged 69; died, April 2, in Kansas City, Mo., of coronary occlusion and arteriosclerosis.

GEORGE P. POWELL, Dixon, Ill.; Jefferson Medical College of Philadelphia, 1893; a Fellow, A. M. A.; served during the World War; on the staff of the Dixon Public Hospital; aged 61; died, February 8, in Hermosa, Calif., of toxic poisoning.

GEORGE E. ROLLINS, Peoria, Ill.; Rush Medical College, 1884; aged 68; died, March 21, of pneumonia following injuries received in a fall.

ASHER F. SIPPY, Chicago; Rush Medical College, 1892; an instructor at Rush, attending physician at Washington Boulevard hospital and associate attending physician at the Presbyterian hospital; member of Illinois State Medical Society; aged 69; died, April 18, of cerebral hemorrhage.

JACOB B. STOGOL, Chicago; Barnes Medical College, St. Louis, 1899; aged 75; died, February 28, of chronic nephritis and uremia.

CHARLES B. TAYLOR, Lincoln, Ill.; University of Louisville (Ky.) School of Medicine, 1881; formerly county coroner; at one time superintendent of the Lincoln State School and Colony; aged 72; died, February 16, in St. Clara's Hospital.

JOHN LETHERMAN TOMBAUGH, Odell, Ill.; Northwestern University Medical School, Chicago, 1903; aged 50; died, February 10, of hemiplegia due to cerebral thrombosis.

JOHN WEINLANDER, Chicago; Rush Medical College, Chicago, 1891; aged 70; died, March 27, probably of organic heart disease.

JOHN LOGAN YOUNG, Flora, Ill.; St. Louis University School of Medicine, 1905; member of the Illinois State Medical Society; aged 64; died, February 22, of a self-inflicted bullet wound.

1931

ellow,
Mary's
mel-

clectic
died,
of the

arnes
Medi-
War;
Hen-
l So-

Ill.;
ch 25,

spital
ber of
mayor
d 69;
occlu-

edical
. A.;
of the
8, in

l Col-
a fol-

ollege,
an at
ttend-
ber of
ril 18,

ollege,
hronic

ty of
merly
e Lin-
Febru-

North-
; aged
rebral

ollege,
bly of

niver-
llinois
22, of